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# THE VETERINARY BULLETIN

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## DISEASES CAUSED BY BACTERIA AND FUNGI

TAYLOR, J. I., & MCDIARMID, A. (1948.) **The use of plasma, incorporated in solid medium, for the detection of coagulase positive staphylococci of bovine origin.**—*J. Comp. Path.* 58. 134-137. 1182

The power of staphylococci to coagulate plasma has been accepted as a reliable index of pathogenicity; methods of determining coagulase production by these organisms are by means of the tube test described by Cruikshank (1937) and the slide technique of CADNESS-GRAVES *et al.* (1945). In solid medium containing human plasma coagulase positive strains of staphylococci have a halo of opacity at the periphery of the colonies.

Comparisons of the tube coagulase test and the opacity test on solid medium incorporating plasma were made with 96 strains of staphylococci from milk or udders. Using rabbit plasma exact correlation was obtained between the two methods. With sheep and ox plasma the correlation was not so good, fewer positives being recorded in the solid medium test than in the tube test.—A. F.

THUERER, G. R., & ANGEVINE, D. M. (1949.) **Influence of dicumarol<sup>(m)</sup> on streptococcal infection in rabbits.**—*Arch. Path.* 48. 274-277. [Authors' summary copied *verbatim*.] 1183

Rabbits treated with dicumarol<sup>(m)</sup> [3,3'-methylenebis (4-hydroxycoumarin)]—Ed. V. B.) usually had an increase of prothrombin time. When they were subsequently infected with an intracutaneous injection of a culture of hemolytic streptococci, the infection spread more extensively than in normal rabbits, and 5 of 13 died with bacteremia. Histologic observations indicate that the lack of fibrin in the tissues of the treated animals is probably a factor in the spread of, in contrast to the localization of, infection in the control animals.

GOTS, J. S., & SEVAG, M. G. (1949.) **Antagonism to sulfathiazole by methylene blue and riboflavin in pneumococcal respiration.**—*J. Bact.* 58. 585-593. [Authors' summary and conclusions copied *verbatim*.] 1184

The inhibitory effects of sulfathiazole on the glucose dehydrogenase activity and respiration of pneumococcus in the presence of methylene blue, azure dyes, and riboflavin have been studied. The dehydrogenase activity is inhibited if the exposure of pneumococci to sulfathiazole precedes the addition of methylene blue. Sulfathiazole, methylene blue, and azure, A, B, & C individually exercise inhibitory effects on the respiration of pneumococci. Sulfathiazole and methylene blue show mutual antagonism resulting in the abolition of inhibition by either agent. Azure dyes, with the possible exception of azure B, fail to show a similar mutual antagonism with sulfathiazole. Riboflavin antagonizes the inhibitions by either sulfathiazole or methylene blue. The combined presence of methylene blue and riboflavin produces a more effective antagonism to sulfathiazole. Sulfathiazole or methylene blue is interpreted as displacing riboflavin from the site as the reaction proceeds. Thus, sulfathiazole or methylene blue exercises greater affinity than riboflavin for the enzyme with which the added riboflavin combines.

SCHALM, O. W., BANKOWSKI, R. A., ORMSBEE, R. W., & BROWNE, T. W. (1949.) **Effect of sulfamethazine on certain infections of the bovine mammary gland.**—*Amer. J. vet. Res.* 10. 56-62. 1185

Intramammary or intravenous injections of sodium sulphamethazine (50 ml. of a 25% aqueous solution into each quarter for four days or 0.5 g. per lb. body weight for three days respectively, the latter followed by oral doses of 1-1.5 g. per lb.) were given to lactating or dry cows with mammary infections with *Staphylococcus aureus*, *Aerobacter aerogenes* or *Pseudomonas aeruginosa* did not cause clinical cure or eliminate the bacteria. Details are given of the blood and milk levels of sulphamethazine throughout treatment.—J. I. T.

MACLAY, M. H., & SLAVIN, G. (1947.) **Sulphonamide investigations. III. The activity *in vitro* of sulphathiazole, sulphadiazine, sulphamerazine, sulphapyridine, sulphamezathine and**



**sulphanillamide on some common animal pathogens.**—*J. comp. Path.* 57. 218-222. 1186

A modification of the Harper-Cawston method was used to examine the bacteriostatic activity *in vitro* of sulphathiazole, sulphadiazine, sulphamerazine, sulphapyridine, sulphamethazine, and sulphanilamide. The activity of the drugs decreased in the order named. Sulphathiazole had the widest range of activity. Of the organisms tested, *Streptococcus agalactiae*, *Corynebact. pyogenes* and *Str. dysgalactiae* were found to be sensitive to all these sulphonamides; *Erysipelas rhusiopathiae* and *Str. uberis* were completely resistant, *Staphylococcus aureus* was also resistant to all the drugs except sulphathiazole; most of the organisms were in an intermediate category, but the number of strains tested in most cases was small.

The value of the tests is discussed.—M. R. O.

KÄSTLI, P. (1949.) Erfahrungen und Beobachtungen mit Penicillintuben zur Behandlung des gelben Galtes der Milchkühe. [Use of penicillin in tubes for the treatment of mastitis in dairy cows.]—*Schweiz. Arch. Tierheilk.* 91. 73-81. 1187

K. describes the use in Switzerland of collapsible intramammary injection tubes introduced in the United Kingdom for treating streptococcal mastitis. At dose rates of 20 and 50 thousand units per ml. oily base, the preparation remained active in quarters between 24 and 36 hours after injection. Three injections within 24 hours cleared 22 out of 23 quarters. After storage at 25°C. for four weeks there was no loss in efficacy.—MALCOLM WOODBINE.

SCHALM, O. W. (1948.) Preliminary observations on the use of streptomycin for the treatment of mastitis caused by Gram-negative bacteria.—*Cornell Vet.* 38. 186-189. 1188

Quarters infected with *Aerobacter aerogenes*, *A. cloacae* or *Bacterium coli* were successfully treated with infusions of 0.5 g. streptomycin in 50 ml. distilled water twice daily for four days. Smaller doses were not effective. Quarters infected with *Pseudomonas aeruginosa* did not respond to treatment. The antibiotic did not irritate the udder tissue.—J. I. TAYLOR.

JELLISON, W. L., ENEBOE, P. L., PARKER, R. R., & HUGHES, L. E. (1949.) Rat-bite fever in Montana.—*Publ. Hlth Rep., Wash.* 64. 1661-1665. [Authors' summary copied *verbatim*.] 1189

A case of rat-bite fever that occurred in the fall of 1948 in a 9-year-old girl living on a farm near Bozeman, Montana, is reported. Streptomycin therapy was initiated 19 days after onset; the patient's temperature became normal within

24 hours, and convalescence was uneventful. Infection apparently resulted from the bite of a mouse, probably a house mouse. *Spirillum minus* was demonstrated in heart-tissue smears of 16 house mice trapped in the farm buildings and in those of one field mouse trapped in a field one-fourth mile away.

KING, H. K., & STEIN, J. H. (1950.) The non-toxicity of *Bacillus anthracis* cell material.—*J. gen. Microbiol.* 4. 48-52. [Authors' summary copied *verbatim*.] 1190

Suspensions of *Bacillus anthracis*, grown under various conditions, and disintegrated by shaking with minute glass particles, were not toxic to mice. The organisms were grown on both simple and complex media, aerobically and anaerobically, with and without extra carbon dioxide, for periods of from 6 hr. to 10 days.

VERGE, J. (1949.) Ensemble de recherches sur la présence du bacille tuberculeux dans la lait de vache. [Incidence of tubercle bacilli in cow's milk.]—*Rev. Path. comp.* 49. 213-215. 1191

Tubercle bacilli were demonstrated in only three samples of milk from 53 tuberculous cows. No tubercle bacilli could be demonstrated in samples of milk from 22 cows that were reactors to the tuberculin test but free from clinical symptoms.

No tubercle bacilli were demonstrated in 16 samples of raw milk from farms in the Paris neighbourhood, nor from 100 samples of pasteurized milk from large dairies in Paris.

The author emphasizes the importance of veterinary inspection of milk.—M. WOODBINE.

FELDMAN, W. H., HUTCHINSON, D. W., SCHWARTING, V. M., & KARLSON, A. G. (1949.) Juvenile tuberculous infection, possibly of avian type.—*Amer. J. Path.* 25. 1183-1195. [Authors' summary copied *verbatim*.] 1192

A study was made of a culture of acid-fast bacilli from a gastric lavage specimen obtained from a female child approximately 2½ years of age. Roentgenographically the lungs showed extensive involvement of the left upper lobe diagnosed as tuberculosis. The child had lived on a Minnesota farm on which tuberculosis among the chickens was rampant. The child played with the chickens, handled eggs, and was a "thumb sucker". Extensive studies of the culture obtained revealed that the physical characteristics and pathogenic behavior of the culture were similar in every respect to those of *Mycobacterium tuberculosis avium*. While the causative relationship of the bacterium to the pathogenesis of the pulmonary disease could not be proved definitely, the evidence strongly indicates such a relationship.



The study illustrates the difficulties of proving unequivocally the etiologic relationship of *Mycobacterium tuberculosis avium* to tuberculous infections in human beings.

THEURER, B. (1949.) Die Bekämpfung der Rindertuberkulose in Deutschland. [Control of bovine TB. in Germany.]—*Dtsch. tierärztl. Wschr.* 56. 359–360. 1193

T. considers that the main reason for the failure of Ostertag's method for the control of TB. in Germany was that although stock owners disposed of clinically affected animals and received compensation there was no real attempt to encourage the rearing of TB.-free calves. A higher price should be paid for milk from TB.-free herds throughout Germany and campaigns for the eradication of TB. should be planned on a regional basis.—E. G. WHITE.

FRANCIS, J. (1950.) Control of infection with the bovine tubercle bacillus.—*Lancet.* 258. 34–39. [Author's summary slightly modified.] 1194

Only 18–20% of all cattle in Great Britain react to tuberculin, but all these have to be regarded as infectious. The figure of "40%", which is so widely quoted, applies to old cows.

Once established in the human lung, the bovine tubercle bacillus is just as virulent as the human, though there is reason to think that it has greater difficulty in establishing itself in the lung, and therefore less power of spread from man to man. Scandinavian work has shown that the most serious form of bovine-type pulmonary tuberculosis in man is caused by inhaling infection from cattle, and in country districts about half of all cases of human phthisis may be caused by bovine-type infection.

In country districts in Great Britain there is an inverse relation between the incidence of bovine tuberculosis and the total mortality from human tuberculosis. Data from Denmark show that, though the proportion of tuberculin-positive persons is greater in areas where there are tubercle bacilli in the milk, tuberculous disease is not so

common in such areas as it is in areas where the milk is free from bacilli.

As milk is freed from tubercle bacilli by the eradication of tuberculosis from cattle and by pasteurisation, more will have to be done to protect adolescents from infection, and increase their resistance by immunisation with B.C.G.

Of about 9 million cattle in Great Britain, some 1½ million are now in attested herds which are maintained free from tuberculosis. Area eradication of the disease is to begin next autumn.

A system of meat inspection organised by the Animal Health Division could materially assist the scheme by producing data on the incidence of tuberculosis.

The attested herds scheme is now based on the "comparative" tuberculin test in which carefully standardised mammalian and avian P.P.D. tuberculins are used. In testing human beings, however, wide use is still made of Koch's Old Tuberculin. As this cannot be accurately standardised, its replacement by purified protein derivative might be considered.

As bovine tuberculosis is eradicated the risk of cattle being infected from man will increase. People who look after cattle may need to be examined in order to prevent infection of the animals—as well as for other reasons.

Eradication of bovine tuberculosis will increase the efficiency of meat and milk production. Indeed, this may prove to be its most valuable contribution to public health and well-being.

GREEN, H. H. (1946.) Weybridge P.P.D. tuberculins.—*Vet. J.* 102. 267–278. 1195

This is a detailed review article describing past and present methods of preparing tuberculin in America and in England. The discussions include the Purified Protein Derivative (P.P.D.), the manufacture of Weybridge P.P.D. Tuberculins, the preparation of Dry P.P.D. Powder, Avian P.P.D. Tuberculin, Bovine P.P.D. and other P.P.D. Preparations; the Nature of P.P.D. and the Relative potencies of officially recognized tuberculins. The following chart is given of specificity factors—

Type of sensitization	Human	Bovine	Avian	Johne	Phlei	BCG
Phlei ... ..	150	150	100	50	1	150
Human ... ..	1	½	20	30	150	2
Bovine ... ..	1	1	40	30	150	2
Avian ... ..	20	40	1	3	100	40
Johne ... ..	10	10	3	1	50	10
BCG ... ..	1	½	20	30	150	1



MAGNUSSON, J. H., & LITHANDER, A. (1949.) **BCG tuberculin studies. An experimental and clinical investigation.**—*Pediatrics*. 3. 429-441. [Spanish abstract.] 1196

A tuberculin, prepared from 11-day culture filtrates of BCG organisms on Sauton's medium, was standardized against commercial tuberculin by intradermal tests on g. pigs infected with tubercle bacilli of the bovine type. BCG tuberculin produced reactions in BCG sensitized g. pigs at an earlier stage than the corresponding amount of commercial tuberculin. In BCG vaccinated children similar results were obtained, the BCG tuberculin producing reactions more often than equivalent amounts of commercial tuberculin. Children sensitive only to BCG tuberculin in the first test after vaccination are subsequently also sensitive to commercial tuberculin.

[Abstractor's Note.—In g. pigs sensitized with human or bovine type tubercle bacilli, 2 units by weight of BCG protein produce the same reaction as one unit by weight of *Mycobact. tuberculosis* protein human or bovine type. In BCG sensitized g. pigs, BCG protein and the protein of human or bovine type produce the same reaction if equal weight units are inoculated intradermally [see H. H. GREEN, preceding abst.]. Therefore, by standardizing on mammalian sensitized g. pigs the authors of this paper may in fact have been inoculating 2 weight units of BCG protein as opposed to one weight unit of commercial tuberculo-protein. Consequently, in BCG sensitized subjects, earlier and greater reactions would be produced with BCG tuberculin.—A. B. PATERSON.]

BIRKHAUG, K. (1949.) **Correlation of numbers of cutaneous BCG vaccination papules and subsequent tuberculin allergy and tuberculosis resistance in guinea pigs.**—*Amer. Rev. Tuberc.* 60. 547-556. [Spanish summary. English summary and conclusions copied *verbatim*.] 1197

The multiple puncture method of BCG vaccination produced in guinea pigs the most rapid and intense tuberculin allergy when 15 or more punctures were made through skin moistened with 20 mg. per ml. BCG vaccine. The best tuberculin allergy was produced by 40 BCG vaccination papules.

A significant resistance to a virulent tuberculous infection was acquired by guinea pigs having received 15 or more punctures. The most effective specific immunity was produced by 40 BCG vaccination papules.

It is recommended, therefore, that the practice of 30 to 40 percutaneous punctures in BCG vaccination of both children and adults be continued in order to produce the most rapid

allergy and durable resistance to tuberculous disease.

FAVOUR, C. B., FREMONT-SMITH, P., & MILLER, J. M. (1949.) **Factors affecting the *in vitro* cytotoxicity of white blood cells by tuberculin.**—*Amer. Rev. Tuberc.* 60. 212-222. [Spanish summary. English summary copied *verbatim*.] 1198

A portion of the white blood cells in heparinized whole blood from patients acutely ill with tuberculosis is lysed by tuberculin (PPD) *in vitro* within one hour. This phenomenon bears a rough correlation with focal allergic manifestations of the tuberculous process but not with the degree of the cutaneous reaction to tuberculin. The mechanism of the tuberculin reaction is briefly discussed.

ZETTERBERG, B. (1949.) **Effects on tubercle bacilli of bacteriostatics, respiration inhibitors and bactericides.**—*Acta path. microbiol. scand.* Suppl. No. 82. pp. 151. [In English.] 1199

This monograph is both a review and an account of the author's experimental work. The subjects dealt with include the cultivation of the organism; growth-inhibiting effects of *p*-aminobenzoic acid, sulphonamides, sulphones, dyes, antibiotics and various organic compounds in different media; an examination of the organism's respiration and its inhibition; studies, by various methods, on bactericidal effects and antagonistic experiments with reference to *p*-aminobenzoic acid, cysteine and serum. The selectivity of the various agents and their morphological effects are also considered.—MALCOLM WOODBINE.

I. STEENKEN, W., Jr., & PRATT, P. C. (1949.) **Streptomycin in experimental tuberculosis. III. Effect on the pathogenesis of early tuberculosis in the guinea pig infected with streptomycin-sensitive H37 Rv tubercle bacilli.**—*Amer. Rev. Tuberc.* 59. 664-673. [Authors' conclusion copied *verbatim*.] 1200

II. PRATT, P. C., & STEENKEN, W., Jr. (1949.) **Streptomycin in experimental tuberculosis. IV. Effect on the pathogenesis of early tuberculosis in guinea pigs infected with streptomycin-resistant H37 Rv tubercle bacilli.**—*Ibid.* 674-678. [Authors' conclusions slightly modified. For part II, see *V. B.* 19. 532.] 1201

I. The early dissemination of tubercle bacilli in the normal guinea pig is not affected by streptomycin therapy.

Although streptomycin limits the progression of tuberculous lesions in the guinea pig, lesions do progress despite adequate therapy, until acquired host-resistance develops, as shown by the development of skin hypersensitiveness.



II. The early course of the disease in guinea pigs infected with H37 Rv tubercle bacilli resistant to 1,000 $\gamma$  of streptomycin per cc. was not appreciably altered by streptomycin therapy.

Lesions of tuberculosis under the conditions of this experiment were similar in extent in the treated and the control animals. The histological appearance of the lesions was similar in the two groups except that fewer Langhans' cells were seen in the treated animals.

VALLENTIN, G., TÖRNELL, E., BESKOW, A., CARTENSEN, B., THUNE, R., HELLEBERG, G., & LEHMANN, J. (1950.) **PAS in pulmonary tuberculosis.**—*Tubercle, Lond.* 31. 2-10 [Authors' summary copied *verbatim*.] 1202

When comparing the total material with the selected there was not found as great a difference in the results as might have been expected. This will find its explanation in the fact that the total material only included 15 per cent of cases in which the collapse therapy was instituted in such a manner that it would interfere with the judgment of the PAS [*p*-aminosalicylic acid.—Ed. V. B.] effect.

Summarizing the results of the PAS treatment, the most impressive effect was seen in the temperature, sedimentation rate, gain in appetite and weight and the general condition of the patients. These changes were found to occur in close connexion with the beginning of the treatment, in most cases within one to three weeks. The simultaneous decrease in sputum and conversion of the bacillary findings together with regressions in the pulmonary infiltrations and cavities, further increased the impression that PAS treatment has been found able to change the normal picture of the clinical events in cases of pulmonary tuberculosis in converting a progressive phase into a healing phase.

MCCNELLY, E., & RIDDELL, W. A. (1949.) **Use of egg embryos in the culture of *Mycobacterium tuberculosis*.**—*Amer. J. publ. Hlth.* 39. 1463-1467. [Authors' summary copied *verbatim*.] 1203

The culturing of the tubercle bacillus in embryonated eggs is possible as a routine procedure. Inoculations on the chorioallantoic membrane have the advantage that lesions are evident and capable of evaluation as to type. It is a convenient method for enrichment prior to animal inoculation. Further studies are being undertaken in relation to the type of lesion found in typical, atypical, and nonvirulent strains of acid-fast organisms and the appearance or disappearance of organisms from the lesions.

SCHAEFER, W. B., MARSHAK, A., & BURKHART, B. (1949.) **The growth of *Mycobacterium tubercu-***

**losis as a function of its nutrients.**—*J. Bact.* 58. 549-563. [Authors' summary copied *verbatim*.] 1204

A method is described that permitted the quantitative measurement of the diffuse growth of *Mycobacterium tuberculosis* in sorbitan monooleate medium.

This method was applied to the study of the growth of *Mycobacterium tuberculosis* as a function of its carbon and nitrogen sources. In the presence of an ammonium salt and glucose, the growth rate depended on the initial concentration of glucose in the medium and reached its upper limit at a concentration of 10 mg per ml.

When glucose was present in the medium in small amounts, it became the limiting factor for growth. The maximum bacterial yield in dry weight was 25 per cent of the weight of the glucose supplied.

When ammonium nitrogen was present in limiting amounts and glucose was in excess, the total amount of bacterial growth was proportional to the initial concentration of the ammonium salt. When maximal growth was reached under these conditions, autolysis of the bacteria followed at more or less rapid rate depending on the initial glucose concentration in the medium. Experiments designed to analyze this phenomenon suggested that the bacteria, which were growing in the presence of limiting amounts of the nitrogen source and an excess of the carbon source, continued proliferation not only until the nitrogen source in the medium was depleted but also for at least one generation beyond the point of nitrogen exhaustion.

SPENDLOVE, G. A., CUMMINGS, M. M., & PATNODE, R. A. (1949.) **Toxicity of sputum digestants to tubercle bacilli in water and sputum.**—*Amer. Rev. Tuberc.* 60. 628-633. [Spanish conclusions. English conclusion copied *verbatim*.] 1205

Experiments were undertaken to compare the toxicities of various commonly used digestants. Trisodium phosphate and sodium hydroxide appeared to be less toxic to tubercle bacilli than the other agents tested.

ANDREJEW, A. (1946.) **Contribution à l'étude du métabolisme respiratoire des bacilles paratuberculeux. I.—Métabolisme respiratoire du bacille de la fièvre.** [**Respiratory metabolism of the mycobacteria. I. Respiratory metabolism of *Mycobact. phlei*.**—*Ann. Inst. Pasteur.* 72. 365-376.] 1206

The author studied the respiration of *Mycobact. phlei* using the Warburg apparatus in regard to the influence of age, of different temperatures, and the presence or lack of oxygen. The organ-



isms were also examined in a solution devoid of nutrient material. It was found that decrease in the respiratory metabolism was closely connected with decrease in viable bacteria. Both lack of oxygen and lack of nutrient material were found to produce a rapid decrease in the respiratory metabolism of the organisms.—E. K.-N.

FROBISHER, M., Jr., KLEIN, G. C., & CUMMINGS, M. M. (1949.) **Preservation of mycobacteria by desiccation in vacuo.**—*Amer. Rev. Tuberc.* 60. 621-627. [Spanish summary. English summary copied *verbatim*.] 1207

Twenty-seven strains of acid-fast bacilli were involved in this study. Of these, 18 were *M. tuberculosis* (5 human, 6 bovine, and 7 avian), and 9 were various saprophytes (such as *M. smegmatis*, *M. leprae*, "timothy" (*M. phlei*)). These bacteria were desiccated in a vacuum bottle in 1931, stored in a refrigerator, and remained undisturbed for seventeen years until 1948 when the bottle was opened and attempts were made to reactivate the cultures.

On introduction into appropriate media, all strains grew readily. Their morphology, staining properties, and virulence appeared unchanged. A few were lost because of overgrowth by contaminants, but sufficient growth of acid-fast bacilli occurred to demonstrate the viability of microorganisms. One human (Saranac H37), one bovine (Opie B 1), and two avian (B A I Parrot and B A I Swine) strains of *M. tuberculosis* were avirulent but all of the other strains of tubercle bacilli were fully virulent. No data were available as to the state of virulence of the cultures when originally desiccated, but it is thought that the human strain H37 may have been of low virulence to begin with.

SOBEL, H., & PLAUT, A. (1949.) **The assimilation of cholesterol by *Mycobacterium smegmatis*.**—*J. Bact.* 57. 377-382. [Authors' summary and conclusions slightly modified.] 1208

*Mycobacterium smegmatis* was found to utilize cholesterol actively either in the finely powdered form suspended in the medium or in solution as its succinate. The presence of the side chain appears to be necessary for this action, thus differentiating this organism from several others in respect to its action on steroids. An attempt to find evidence for the dehydrogenation of the steroid nucleus was unsuccessful, as were attempts to demonstrate the conversion of several other theoretical procarcinogens into carcinogens. Several unidentified breakdown products of cholesterol were found, and it is pointed out that acid derivatives might be artifacts produced by molecular oxidation rather than bacterial metabolites.

MORSE, E. V. (1949.) **The cultural and biochemical characteristics of some diphtheroid bacilli of animal origin with an ecological study of *Corynebacterium renale*.**—*Thesis, Cornell.* pp. 76. 1209

A morphological, cultural, and biochemical study of 104 strains of corynebacteria. Four of the strains were *C. renale*. All strains were studied in detail. *C. renale* was isolated from the urine of 17.6% of 523 apparently normal dairy cattle. The median-carrier-incidence in ten herds where there had been a number of cases of pyelonephritis was 22.7%. The median-carrier-incidence in six herds in which no clinical cases had been observed over a two year period was 6.7%. Two bacteriologically positive animals exhibited clinical manifestations of pyelonephritis four months after bacteriological examination. Periodic examinations in a dairy herd of 100 cows demonstrated that *C. renale* was being disseminated from carrier cows to their close neighbours. Of all the animals from which *C. renale* was isolated in the absence of clinical symptoms (carriers), the organism was present in 51% on at least two tests. Cultures were made from swabs from the vagina or penis and urine aspirated from the bladder of 108 normal cattle immediately after slaughter. The swab cultures yielded *C. renale* in four instances. No diphtheroid bacilli were recovered from any samples of bladder urine.—H. L. GILMAN.

SVITH, N. (1947.) Rödysge. Kemoterapi—Serumterapi. [*Erysipelothrix rhusiopathiae* infection in man. Chemotherapy—serum therapy.]—*Ugeskr. Laeg.* 109. 979-980. 1210

A brief note on the subject, with some details of infection in two farm women, one of whom had attended a pig with swine erysipelas. The other woman had no history of particular contact with animals or their products, other than that she had recently removed the bone from a joint of veal. In both cases specific antiserum was given with good results.

GRAY, M. L., STAFSETH, H. J., & THORP, F., Jr. (1949.) **The effect of streptomycin on *Listeria*.**—*J. Amer. vet. med. Ass.* 115. 171-173. 1211

Seven strains of *Erysipelothrix (Listeria) monocytogenes* from sheep and eight strains from cattle were used to study the effect of streptomycin on these organisms growing on surface plates of tryptose agar. Most strains grew well initially in the presence of 0.5 unit of streptomycin (hydrochloride) but were almost completely inhibited by 1 unit. After 24 hours the organism grew well at 1 unit and to a slight extent at 3 units. By transferring colonies from low to higher concentrations of the drug it was possible to adapt the organism to medium containing 10 units of



streptomycin and to obtain good growth within 24 hours even at this high level.

*In vivo* tests were carried out in 21 rabbits infected experimentally. Dosage ranged from 2,000–150,000 units per rabbit per day. The results are not given in detail, but the conclusion reached from the small number of animals used was that the drug had little effect on time of survival or monocytosis.

It is concluded that streptomycin is contraindicated in *Listeria* infections because of the rapid development of drug-resistance and the indication that this resistance may become a permanent characteristic of strains exposed to the drug.

—E. G. WHITE.

DELAFLANE, J. P., & HIGGINS, T. C. (1948.) Sulphaquinoxaline in the prevention and control of chronic fowl cholera.—*Cornell Vet.* 38. 267–272. 1212

On a large poultry farm where there was an outbreak of a chronic respiratory form of fowl cholera, two groups of pullets free from clinical signs of the disease were selected and housed separately. One group (110 birds) were fed sulphaquinoxaline continuously at the rate of 0.033% in the mash. The second group (116 birds) received no treatment. At the end of six weeks 45 pullets of the untreated group with severe symptoms were killed and also 16, with milder symptoms, from the treated group. No fresh cases occurred after three weeks in the treated group; these birds were 0.627 lb. heavier on an average than those in the untreated group and egg production was slightly higher. The infection in the remainder of the flock was kept under control by treatment with sulphaquinoxaline in a similar manner.

The authors consider that sulphaquinoxaline is of use in the prevention of spread of the respiratory form of fowl cholera, but it is doubtful if it possesses any curative power in established cases.

—L. G. DONALD.

STAMATIN, N., SERBANESCU & VLADANU, M. (1949.) L'activité pathogène de la toxine des *Pasteurella* pour quelques espèces animales. [The pathogenicity of a *Pasteurella* toxin.]—*Ann. Inst. Pasteur.* 76. 84–86. 1213

The authors found that the g. pig, fowl and, to a lesser extent, the mouse were resistant to *Pasteurella* toxin but that on the other hand the calf, sheep, dog and rabbit were very susceptible.

Details are given of the symptoms in animals given doses sufficient to cause illness and of the lesions found in animals that died.—L. G. D.

STEIN, C. D., MOTT, L. O., & GATES, D. W. (1949.) Pathogenicity and lyophilization of

*Pasteurella bubaliseptica*.—*Vet. Med.* 44. 336–339. 1214

The strain used in this study was isolated in 1922 from an outbreak of haemorrhagic septicaemia in bison in Yellowstone National Park and maintained in culture and passaged through large animals.

The effect of dehydration of frozen culture under high vacuum was studied on cultures isolated after animal passage. The organisms so treated retained their virulence for over nine years whereas cultures maintained on ordinary artificial media lost virulence after three years.

—D. LUKE.

EL BOROLOSSY, A. W., & BUTTLE, G. A. H. (1949.) Experimental typhoid infection treated with chloromycetin and sulphadiazine.—*Lancet.* 257. 559–560. [Authors' summary copied *verbatim*.] 1215

The therapeutic effect of chloromycetin in *S. typhi* infection in mice has been studied. A synergistic action between chloromycetin and sulphadiazine against this infection has been found. Possibly treatment with chloromycetin and sulphathiazole together may give satisfactory results in typhoid fever.

WORMALD, P. J. (1950.) Salmonella infection in a post-mortem room.—*Mon. Bull. Minist. Hlth publ. Hlth Lab. Serv.* 9. 28–30. [Author's summary and conclusions copied *verbatim*.] 1216

After routine autopsy of cases of infection with *Salm. paratyphi B* and *Salm. typhi-murium*, the infecting organism was isolated, in spite of the use of disinfectant, from various parts of the drainage system of the post-mortem table, from cotton over-gloves and from flies captured in the room.

It is recommended that (a) open drainage systems should be regularly flooded with disinfectant and (b) flies should be rigorously excluded and any that do gain access should be destroyed.

ANON. (1949.) Non-pullorum reactions.—*Canad. J. comp. Med.* 13. Facing p. 31. 1217

The Canadian Congress on pullorum disease adopted the term non-pullorum reaction (N.P.R.) to describe non-specific reactions encountered in the agglutination test. These reactions had increased in number with the adoption of the variant or XII<sub>2</sub> antigen and it was felt that the new term would make it clear that they had no bearing on the pullorum status of the flock. The removal of such birds would be advantageous because many are infected with enterococci and coliform types of bacteria and are poor producers. It is possible that these reactions may thus be turned to advantage.—R. GWATKIN.



SHAPIRO, S. K., RHODES, R. A., & SARLES, W. B. (1949.) **Lactobacilli in the intestinal tract of the chicken.**—*J. Bact.* 58. 689-694. [Authors' summary copied *verbatim*.] 1218

One hundred and twenty-five cultures of lactobacilli isolated from the intestinal tract of the chicken are described. The organisms are all catalase-negative, microaerophilic, homofermentative, short, gram-positive, nonsporeforming rods, whose optimum temperature is near 37°C, and which curdle milk slowly.

On the basis of carbohydrate utilization the isolates can be divided into four groups. The largest group (72 per cent of the cultures) produces acid from glucose, fructose, galactose, maltose sucrose, and lactose, but does not utilize trehalose, cellobiose, or salicin. Ten per cent of the isolates do not utilize glucose even after prolonged incubation.

ALBISTON, H. E., PULLAR, E. M., & TALBOT, R. J. DEC. (1949.) **Brucellosis in Victorian pigs.**—*Aust. vet. J.* 25. 287-294. 1219

Two outbreaks are discussed. For serological diagnosis both agglutination and complement-fixation tests were used initially but the C.F. test was discarded as possessing no special advantage. Taking an agglutination titre of 1:50 as diagnostic, about 15% doubtful reactors were found in infected herds. The authors find that the agglutination test is satisfactory when applied repeatedly to a herd. In an infected herd of 100 pigs the disease was eliminated after four tests at 4-6 weeks' interval. Reasons are discussed for the failure of swine brucellosis to become established in Victoria. It is considered that trade movements and economic practices may have prevented the spread of the disease.—R. BAIN.

POTTINGER, F. M., Jr., ALLISON, I., & ALBRECHT, W. A. (1949.) **Brucella infections. Possible relation to deficiency of trace elements in soils, plants, animals and man.**—*N. Amer. Vet.* 30. 710-712. 1220

As trace element therapy for brucellosis in human beings proved promising it was tried on a herd of dairy cattle. The trace elements (manganese, copper, cobalt, magnesium and zinc) were either applied as fertilizers to the soil or fed to the animals. This increased the number of viable calves born and other breeding irregularities were diminished. Blood tests also gave a smaller percentage of positive reactions for *Brucella* infections.—E. EDEN.

ROMAGNOLI, A. (1948.) **Ricerche sulla agglutinazione per le brucelle nei cavalli e negli asini stalloni. [Brucella infection and agglutination test in horses and donkeys.]**—*Ann. Fac. Med. Vet., Pisa.* 1. 134-145. [English, French &

German summaries. Abst. from English summary.] 1221

Sera from 67 stallion horses and 22 donkey jacks were tested for brucella antigens. A positive reaction was obtained from the serum of one of the horses, the titre being 1:100.—J. I. T.

BERMAN, D. T., IRWIN, M. R., & BEACH, B. A. (1949.) **Statistical considerations of controlled experiments in brucellosis.**—*Amer. J. vet. Res.* 10. 180-187. 1222

The authors made a statistical survey of the published results of experiments on the artificial infection of cattle with brucella organisms.

The results from 36 experiments involving 353 animals were studied to emphasize what are significant facts and to expose unfounded beliefs.

There is no doubt that calthood vaccination with strain 19 protects the majority of cattle during their first gestation. The scanty available data on the duration of immunity during the succeeding gestations show disagreement, and more experiments are required to settle this question. No definite correlation is shown between the number of organisms in the infecting dose and the proportion of abortions, but the interplay between the virulence of the organisms and the individuality of the host animal is discussed. Standardization of experimental methods would be valuable in the comparison of results by different workers in this field.—J. KEEPIE.

McNUTT, S. H., & LEITH, T. S. (1946.) **Swine brucellosis: results of a vaccination experiment.**—*Proc. Iowa Acad. Sci.* 53. pp. 307-311. 1223

Twelve gilts 83-161 days old were vaccinated with a virulent *Br. suis* culture, 2 ml. being given subcutaneously and 5 ml. intranasally. After vaccination all reacted to the agglutination test but had ceased to react prior to breeding. One to five days after breeding the 12 vaccinated gilts were given a dose of several ml. of a culture of the same strain of *Br. suis* used for vaccination.

All the controls and three of the vaccinated group aborted and gave persistently high agglutination titres. The remaining nine of the vaccinated group produced normal litters; there was no evidence of brucella in the offspring and no appreciable agglutination titre.

In reviewing other methods of vaccination the authors suggest that if live culture vaccines are to be used, the animals should be vaccinated while sexually immature.—J. I. TAYLOR.

LUNDQUIST, N. S., ZEHNER, C. E., & PHILLIPS, P. H. (1949.) **The effect of vaccination with *Brucella abortus* vaccine (strain 19) on certain blood constituents in young heifers.**—*J. Dairy Sci.* 32. 914-918. [Authors' summary slightly modified.] 1224



In calves blood plasma levels of vitamins A and C are reduced by vaccination with *B. abortus* vaccine (strain 19). The vitamin C level does not return completely to normal after 1 wk. as does the vitamin A level. Vitamin A or C in addition to the normal diet had no effect on the course of blood plasma levels, except to maintain them above that for calves not receiving the supplement.

A rise in rectal temperatures followed closely the drop in blood plasma vitamin C and this may suggest a relationship between the increase in body temperature and a lowering of blood plasma ascorbic acid.

The leucocyte count increased the day after inoculation. The differential count showed that the neutrophiles increased, the lymphocytes decreased, and the monocytes and eosinophiles slightly increased and decreased, respectively, after the vaccination.

LIVE, I. (1949.) Effect of adjuvants upon the immunizing quality of ether-killed *Brucella abortus*.—*Amer. J. vet. Res.* 10. 347-350. [Author's summary copied *verbatim*.] 1225

This study deals with the question of whether ether-killed *Brucella abortus*, adsorbed on alum or combined with falba [a proprietary name for a lanolin-like substance.—Ed. V. B.] and mineral oil, represent a better immunizing agent against infection with *Br. abortus* than the same vaccine without an adjuvant. The results obtained in guinea pigs indicate that either of the two adjuvants combined with the brucella antigen distinctly enhances its ability to prolong the state of resistance, although the saline-in-oil emulsion of the vaccine proved more efficacious, in that respect, than the vaccine precipitated with alum. From the standpoint of the influence of the adjuvants upon the duration of immunity, problems concerning the most suitable immunizing doses and the best mode of administration of the vaccine need further investigation.

The finding of an efficient vaccine consisting of killed brucella cells would obviate some of the objections raised against the use of live brucella vaccines in animals. It could also lead to the development of a much needed immunizing agent against brucellosis in man.

SANDERS, E., & HUDDLESON, I. F. (1950.) The influence of oxygen on the metabolic activities of brucella.—*Amer. J. vet. Res.* 11. 75-83. [Authors' summary slightly amended.] 1228

The metabolism of glucose by all species of *Brucella*, when grown as described, is a rapid oxidation of the carbohydrate. The major end product is carbon dioxide.

More glucose was decomposed per unit number of cells by all species when pure oxygen

was supplied than when the medium was exposed to stagnant air. *Brucella suis* decomposed less glucose per unit number of cells than did the other two species.

Ammonia evolution was most rapid from cultures of *Br. suis* in all media. A sparing action of glucose for peptone was noted for all species but was much less pronounced for *Br. suis*. The pH changes that occur in media during the growth of *Brucella* emphasize the unreliability of any method of determining carbohydrate utilization that depends on detection of acidity.

The rates of reactions of the enzyme systems of *Brucella* account for the differences of the three species in the decomposition and metabolism of peptone, glucose, pyruvate, and lactate.

ŠTERZL, J. (1948.) Růstové působky rozpustné v oleji u *Brucella abortus*. [Oil-soluble growth factors for *Brucella abortus*.]—*Čas. Lék. čes.* 87. 1215-1219. [English summary.] [Abst. in *Bull. Hyg., Lond.* 24. 281. (1949), copied *verbatim*. Signed: D. J. BAUER.] 1227

The effect of the oil-soluble vitamins A, D<sub>2</sub>, E and 2-methyl-1:4-naphthoquinone on the growth of *Brucella abortus* has been studied. The substances were dissolved in oil and emulsified with water, and added to nutrient agar in various quantities. A standard amount of a suspension of the organism was then plated out on the agar. Some preliminary experiments on type differentiations with the aid of dyes were carried out on 18 strains of *Br. abortus*; the best results were obtained with Huddleson's liver infusion agar with the addition of 1/50,000 fuchsin and 1/30,000 thionine. It was found that some strains could grow on a synthetic medium containing ammonium salts as the sole source of nitrogen. When four such strains were grown on the same medium with the addition of vitamin A a great increase of growth was obtained; no definite effect on growth was produced by addition of the other oil-soluble vitamins. With the remaining strains which would not grow on the synthetic medium the addition of vitamin A produced growth in six instances; it thus acted as a growth factor. The most effective concentration of vitamin A was between 6 and 60γ per cc. Vitamin A stimulated the growth of all 18 strains when they were grown on nutrient agar.

SCHUHARDT, V. T., RODE, L. J., & OGLESBY, G. (1949.) The toxicity of certain amino acids for brucellae.—*J. Bact.* 58. 665-674. [Authors' summary copied *verbatim*.] 1228

Tryptophan and cystine were found to be highly toxic to *Brucella abortus* 1257 in a medium containing no other amino acids. Two additional amino acids methionine and phenylalanine, were



slightly toxic to this organism, whereas none of the other 15 amino acids of the casein digest series proved toxic at concentrations well above those found in 1 to 2 per cent casein digests. Only the cystine toxicity for this organism showed a persistence in the presence of other amino acids, which might implicate it as the antibrucella factor of casein and other digest media.

Cystine toxicity for brucellae correlates in many respects the previously reported tryptose toxicity for these organisms. However, we are not yet sure whether the two are or are not identical.

Forty-two strains of *B. abortus* showed markedly less tolerance for cystine than did 10 strains of *Brucella suis*. Acclimated strains of *B. abortus* tended to be less tolerant than CO<sub>2</sub>-requiring strains. Nine strains of *Brucella melitensis* were intermediate in their tolerance for cystine.

The cystine content of certain synthetic media was shown to be responsible for the failure to obtain growth of some strains of *B. abortus*.

Cysteine tended to give zonal inhibition of growth of *B. abortus* 1257. This zone was explained in terms of the balance between the tendency of cysteine to be oxidized to cystine and the toxicity-reversing effect of residual cysteine. Varying amounts of the reducing agent sodium formaldehyde sulfoxylate restricted and, with increasing amounts, eliminated the zonal toxicity of cysteine.

EVANS, D. G., & PROPHET, A. S. (1950.) Disintegration of human dentine by bacterial enzymes.—*Lancet*. 258. 290-293. [Authors' summary copied verbatim.] 1229

Finely divided dentine powder was prepared from human teeth by the low-temperature grinding of dentine. Decalcified dentine powder was prepared from dentine powder by treatment with N/5 HCl. An investigation was made of the ability of a number of bacterial species to produce enzymes which would disintegrate decalcified dentine powder suspended in an agar gel.

Of the clostridia tested, *Cl. histolyticum* was the most active producer of enzyme, *Cl. welchii* A was less active, and *Cl. sporogenes* and *Cl. bifermentans* were only slightly active. Of the aerobic species tested, *B. subtilis*, *B. cereus*, *B. megatherium*, *B. brevis*, *B. mycoides*, and *B. anthracis* could produce enzyme, though not in high concentration. Tests with *Cl. histolyticum* enzyme showed that it was unable to attack the organic component of dentine before decalcification.

Dentine decalcified by mild acid action at pH 6.2 was as susceptible to attack by *Cl. histolyticum* enzyme as dentine decalcified by strong acid solutions. Dentine was simultaneously

decalcified and its organic component disintegrated by solutions of *Cl. histolyticum* enzyme at pH 6.2-6.8.

BISSET, K. A. (1950.) The sporulation of *Clostridium tetani*.—*J. gen. Microbiol.* 4. 1-3. [Author's summary copied verbatim.] 1230

In the sporulation of *Clostridium tetani*, a rod-like fusion nucleus is formed from the two nuclear units typical of a "smooth" bacillus. The fusion nucleus divides into two smaller rods, one of which degenerates; the other is included in the spore. The nucleus remains rod-shaped until the maturation of the spore is almost complete, when it is transformed into a spherical, eccentric spore nucleus.

SIMMONS, G. C. (1949.) A note on *Vibrio fetus* infection of cattle in Queensland.—*Aust. vet. J.* 25. 297-299. 1231

Three cases are described from herds in which vaccination with *Brucella abortus* strain 19 had been carried out. Abortions occurred at 6-7 months. Many of the organisms isolated had a single flagellum at both ends when stained by Kirkpatrick's method. This is the first record of *V. fetus* in Queensland.—R. BAIN.

BUXTON, A., DARCEL, C. LE Q., GORDON, R. F., & SMITH, C. H. (1949.) Suspected monilliasis in turkeys.—*Vet. Rec.* 61. 828-829. 1232

A fatal disease of young poults associated with the presence of a fungus is recorded. Scattered areas of necrosis were found in the crop. From these lesions a fungus, which appeared to be *Candida albicans*, was isolated.—D. LUKE.

FOLEY, G. E., & WINTER, W. D., Jr. (1949.) Increased mortality following penicillin therapy of chick embryos infected with *Candida albicans* var. *stellatoidea*.—*J. infect. Dis.* 85. 268-274. [Authors' summary copied verbatim.] 1233

The administration of a single dose of 500 Oxford units of crystalline penicillin G on the chorioallantoic membrane of 10-day chick embryos increased the mortality resulting from *Candida albicans* var. *stellatoidea* or *C. albicans* infection. A similar enhancing effect was observed in rabbits infected with *C. albicans* var. *stellatoidea* and treated with a daily intramuscular dose of 150,000 Oxford units of crystalline penicillin G.

Preliminary observations further suggest that penicillin also has an in vitro stimulatory effect on *C. albicans* var. *stellatoidea*.

SLATTER, E. E., BRASMER, T. H., & SHIDELER, R. K. (1949.) Leptospirosis in calves.—*N. Amer. Vet.* 30. 439-441. 1234

The authors report the finding of leptospirosis in calves [presumably one month old] following a long railway journey. At first the usual pneumo-



enteritis complex of transit fever was diagnosed and the animals were treated accordingly, with one death out of nine animals. Nine days later, one of the calves became ill and died the next day, the only abnormalities found being anaemia and blood-tinged urine. A second calf died the same day, showing only pneumonia in the cardiac lobes. Four days later, a third calf died, again with anaemia and blood-tinged urine. *Leptospira* were found in the kidney and liver. *Leptospira* were also found in the blood of a sick calf in another group of the same shipment of animals.

After these results, the authors tested for and found the infection in other calves [no details given] that were generally unthrifty and which had previously been thought to be affected by general debility, resulting from poor nutrition and the more common calfhood infections.—I. W. J.

MORNET, P., BALLIS, J., & BACHIROU, S. M. (1949.) Action de quelques antibiotiques sur le virus péripneumonique bovin. [Antibiotics and bovine contagious pleuropneumonia.]—*Bull. Acad. vét. Fr.* 22. 225-227. 1235

For purposes of comparison the authors converted units of penicillin into mg. i.e., 10,000 Oxford units = 6 mg. sodium penicillin G.

They found that up to 30 mg. per ml. of penicillin were without effect upon the organism of bovine contagious pleuro-pneumonia; upwards of 0.02 mg. per ml. of streptomycin was bactericidal; upwards of 0.005 mg. per ml. of tyrothricin was bacteriostatic. In the case of inhibition by streptomycin, subculture of affected organisms into broth medium did not result in renewed

growth, while organisms inhibited by tyrothricin recovered after 1-3 weeks.—R. MARSHALL.

EDWARD, D. G. FF. (1950.) An investigation of pleuropneumonia-like organisms isolated from the bovine genital tract.—*J. gen. Microbiol.* 4. 4-15. [Author's summary copied *verbatim*.] 1236

Two members of the pleuropneumonia group, provisionally called the P and S species, were isolated from the genital tract of cattle.

The P strains required serum for artificial cultivation. Cultures on horse serum media had a characteristic appearance, due to the precipitation of a substance, probably protein; this aided identification. Strains differed antigenically, although common antigens were sometimes shared; antisera were prepared in rabbits against three different serological types. Agglutinins for P. strains were not found in sera of infected cattle. There is some evidence that these strains may be capable of causing an inflammation of the genital tract which predisposes to infertility.

The S strains resembled the saprophytic members of the pleuropneumonia group, to which they were serologically related; they grew at room temperature and on media devoid of serum. They were antigenically distinct from P strains. They may be commensals or gain access to discharges as contaminants.

The observations in cattle suggest further study of strains of pleuropneumonia-like organisms isolated from the human genital tract. The assessment of their pathogenicity for man may be complicated by the presence of more than one species in the human genital tract.

See also absts. 1264 (streptococcal anaemia); 1266-1267 (swine fever, complications); 1381 (spirochaetosis); 1409 (antibiotic); 1410 (penicillin); 1417 (*Salmonella* infection); 1419-1421 (gaseous ethylene oxide); 1457 (*Salmonella* food poisoning); 1460 (sewage sludge); 1513 (India, report); 1514 (Nyassaland, report); 1515-1516 (Denmark, reports); 1518 (U.S.A., report); 1520 (book, BCG vaccination); 1521 (book, antibiotics).

## DISEASES CAUSED BY PROTOZOAN PARASITES

VON BRAND, T., & TOBIE, E. J. (1948.) Further observations on the influence of cyanide on some trypanosomes.—*J. cell. comp. Physiol.* 31. 49-68. [Authors' summary copied *verbatim*.] 1237

The respiration of the blood stream form of *T. evansi*, *T. equinum*, *T. rhodesiense*, *T. gambiense*, and *T. congolense* was identical whether the coagulation of the blood which served as the respiratory medium was prevented by citrate, heparin, or defibrination. Only *T. rhodesiense* showed a decline in respiratory rate in the combination heparin plus M/100 cyanide. The respiratory intensity of the flagellates was inversely correlated with the density of the population used. The response to cyanide was identical whether

Krebs' or Robbie's absorption mixtures were used for the removal of the carbon dioxide. The respiration of *T. evansi*, *T. equinum*, *T. rhodesiense*, and *T. gambiense* was not inhibited, but rather stimulated by enzyme inhibiting concentrations of cyanide (M/1000 to M/100,000). The oxygen consumption of *T. congolense*, on the other hand, proved it to be cyanide sensitive.

The glucose consumption of the species with cyanide stimulated respiration was also increased under the influence of that poison. The quantitative relationship between oxygen and glucose consumption showed that the stimulatory effect of cyanide consists essentially in a stimulation of the normal sugar metabolism. In *T. congolense* a pronounced decrease of glucose degradation was



observed in M/100 and M/1000 cyanide, but a moderate stimulation occurred in M/10,000 and M/100,000 cyanide.

All species studied were typical aerobic fermenters, consuming but 16 to 26% of the oxygen required for complete oxidation of the utilized glucose.

ANGELOTTI, S. (1949.) Surra spontanea nel cane per ingestione di organi di cammelli infetti.

[Spontaneous *Trypanosoma evansi* infection in a dog as a result of ingestion of offal from infected camels.]—*Clin. vet., Milano*. 72. 138-141. [English summary.] 1238

An account of *T. evansi* infection in a dog, resulting from the ingestion of offal from infected camels.

TERPSTRA, J. I., & POST, R. (1947.) De diagnostiek en bestrijding der trichomonadeninfecties bij het rund. [Diagnosis and control of *Trichomonas* infections in cattle.]—*Tijdschr. Diergeneesk.* 72. 225-236. [English summary.] 1239

For the detection of *Tr. foetus* in female animals the authors recommend the examination of vaginal secretions 12-20 days after service by a suspected bull and again a few days before the next oestrus and examination of discharged pus from the uterus or vaginal mucus within 48 hours of aborting. They remind the reader that an undulating membrane is absent in *Tr. ruminantium*. Two media are recommended for plating out material which has been delayed in transit. The serological test is considered reliable for proving the presence of infection in a herd. The authors believe the Tricine test to be reliable and consider an increase of 4 mm. in the thickness of the skin as positive.

Bulls in artificial insemination centres should be tested for infection and cows should be examined when abortions occur. Lugol's solution (1:2:200), chinosol (1:1000) and other uterine and vaginal irrigations are recommended in cows. Infected bulls are not readily cured; in valuable animals an application of 0.5% trypanflavine ointment to the surface of the penis and injection of 30 ml. trypanflavine solution (1:1000) into the urethra are recommended.—P. L. LE ROUX.

DELPY, L.-P. (1946.) Description de formes schizogoniques de *Babesia bigemia*. Comparaison avec des formes identiques, décrites par E. Dschunkowsky, 1937, sous le nom *Luhisia bovis* n.sp. [Schizogony in *Babesia bigemina*.]—*Ann. Parasit. hum. comp.* 21. 225-234. 1240

D. examined heart blood and organ smears from a calf that died following inoculation with rinderpest virus, which caused a breakdown of a latent infection with *B. bigemina*. In blood smears

from the heart, kidney and brain, there were large and small intracorpuseular organisms, extra-corpuseular forms and division forms, which D. maintained were shizogonic forms of *B. bigemina*. These latter structures were apparently identical with those described by Dschunkowsky as *Luhisia bovis* n.sp. The author submits a new list of the characters of the family Piroplasmidae, in which he includes nine and possibly ten genera.

—M. L. CLARKE.

JACOB, E. (1949.) Parasitologische Notizen. [Notes on parasitology. V.]—*Berl. Münch. tierärztl. Wschr.* No. 5. pp. 56-57. 1241

Brief notes are given on the male *Cheyletiella pinguis*, the recorded avian hosts of the muscid, *Carnus hemapterus*, and the transmission of *Isoospora bigemina* from the silver fox to the domestic cat.—M. L. CLARKE.

BIOCCA, E. (1949.) Osservazioni sulla posizione sistematica del toxoplasma. [The place of toxoplasms in nature.]—*Riv. di Parassit. Rome*. 10. 73-92. [Abst. in *Trop. Dis. Bull.* 46. 972. (1949), slightly modified. Signed: H. HAROLD SCOTT.] 1242

More than 40 years ago Nicolle and Manceaux described a protozoon in a rodent in North Africa and named it *Toxoplasma gondii*. Others remarked on its likeness to *Leishmania*, others again to *Encephalitozoon*. Cases of human infection have been reported by Castellani in Ceylon, but Wenyon has cast doubt on these. In short, there seems to have been a certain degree of confusion between *Toxoplasma*, *Encephalitozoon*, *Soroplasma* and *Sarcosporidia*, and the place of *Toxoplasma* in nature is yet to be determined.

From a consideration of this vexed subject the author concludes: 1, that *Toxoplasma*, if it is to be regarded as a protozoon, has a simple morphology (as described in the textbooks), is non-motile, but endowed with a gentle sliding motion (*scivolamento*), capable of infecting many vertebrata, penetrating and multiplying in the tissues; 2, it differs from Rhizopoda, Flagellata, Ciliata and Sporozoa; 3, the reputed species *T. cuniculi*, *T. caviae*, *T. canis*, *T. muris*, *T. hominis*, etc., merely indicate that *Toxoplasma gondii* has been found in different hosts and that there is only one valid species; 4, The genera *Encephalitozoon* and *Soroplasma* have no characters sufficiently valid to separate them from *Toxoplasma*, and therefore, 5, one cannot accept the species of *Encephalitozoon*, e.g. *E. cuniculi*, *E. brumpti*, *E. rabiei*, etc., as valid; 6, *Toxoplasma* and *Sarcosporidia* are easily differentiable, morphologically and biologically, though they have certain characteristics in common.

See also absts. 1307 (immune factors); 1374 (*Pl. lophurae* infection); 1460 (sewage sludge); 1514 (Nyasaland, report).



## DISEASES CAUSED BY VIRUSES AND RICKETTSIA

DE KOCK, G. (1949.) **Foot and mouth disease problems in Southern Africa.**—*J. S. Afr. vet. med. Ass.* 20. 1-8. 1243

The main outbreaks of F. & M. disease which have been identified in Southern Africa since the outbreak in Southern Rhodesia in 1931 were surveyed. They have occurred at frequent intervals and over a wide area. The author made suggestions regarding their possible origin and indicated the general methods adopted to eradicate the disease.

Information regarding the occurrence and spread of the disease in Southern Africa is considered to be very inconclusive and the seven points submitted for consideration at the Bulawayo Conference in July 1948 are quoted.

Methods of eradication have varied in the different countries. One such method has been the infection of all contact herds with virulent virus. It is urged that this method should be discontinued. It increases the possibility of creating "carriers" in cattle and also increases the risk of transmission of the disease to various species of game amongst which it might continue to smoulder. Game are strongly suspected of causing many of the outbreaks.

In the Union of South Africa "slaughtering out" and "starving out" (by quarantine, cordoning of infected areas, erection of fencing and formation of infected "camps") have been used successfully as methods of control. It is suggested that the adoption of these methods together with the use of a vaccine (Schmidt-Waldmann or crystal violet) in all contact herds should finally eradicate the disease. Such a policy would call for adequate staff and transport for expeditious enforcement of the measures.

It is suggested that a F. & M. Disease Research Institute in Southern Africa would be a valuable project, both for the production of vaccine and for research on the special problems introduced by the susceptibility of game.

—H. H. SKINNER.

ANON. (1949.) **Two viruses cause trouble.**—*N. Amer. Vet.* 30. 754 & 756. 1244

Outbreaks of F. & M. disease in Mexico have recently been proved to be caused by O. virus. A slaughter policy is being adopted until the extent to which the infection has gained a foothold is known. A bivalent vaccine may have to be introduced if it is found to be more widespread than it is at present thought to be. Its origin is being investigated.

A variant strain of swine fever virus has been reported in Mid-Western U.S.A. Normal serum-virus immunization methods have proved ineffec-

tive. The findings of the Bureau of Animal Industry have tended to confuse the issue; for pigs vaccinated normally had a solid immunity against the variant, whilst regular serum failed to protect against the variant inoculated simultaneously. The variant also appears to be of lower virulence. Many questions remain unanswered and work is proceeding.—G. V. L.

LANUSSE, J. M. (1947.) **Indice cloremico de la fiebre aftosa experimental (cobayos, porcinos y bovinos).** [The chloride content of the blood in experimental foot and mouth disease in g. pigs, swine and cattle.]—*Inf. Direcc. pat. Anim., B. Aires.* No. 235. pp. 121-129. 1245

After determining the normal values for chloride in blood cells and plasma in g. pigs, pigs and cattle, L. estimated the same values in those animals 1-3 days after generalization of experimental F. & M. disease. In most of the animals there was acid-base imbalance, the majority being cases of alkalosis. The chloride indices (relation between cellular and plasma chlorides) were as follows—g. pig, normal 0.44, diseased, 0.40; pigs, normal, 0.45, diseased, 0.40; cattle, normal, 0.48, diseased, 0.47.—I. W. JENNINGS.

BERNARD, R., GIRARD, H., HIRTZ, J., MACKOWIAK, C., & LORRIN, R. (1949.) **Observation du virus de la fièvre aphteuse au microscope électronique.** [Observations on foot and mouth disease virus with the electron microscope.]—*C. R. Acad. Sci., Paris.* 229. 1272-1274. 1246

In a study of the microscopy of F. & M. disease virus, the authors used vesicle material of a case in a bovine animal. A suspension was made in a buffered solution at pH 7.4, the supernatant liquid being centrifuged, passed through a Seitz filter and proved to be virulent at a titre of  $10^{-8}$ . Examined under the electron microscope, spherical particles of 20-30  $m\mu$  diameter were observed, occurring in groups or in a reticulate arrangement. This formation appeared to be specific and was not found in similar preparations from normal lingual epithelium or from small ulcers caused by cauterization of the tongue.

In an attempt to concentrate the virus by lyophilization it was found that the quantity of dry residue from the virulent solution was ten times greater than that of the analogous residue derived from normal epithelium, and that under the electron microscope the particles described above were present in the residue from the infective material.

After two passages of the original virus in embryonated fowl eggs, the allantoic liquid of the eggs was virulent for cattle. Under the electron microscope, spherical particles similar to those



described were present: these were absent from normal allantoic fluid.

The authors concluded therefore that it is reasonable to believe that these spherical particles were the actual virus of F. & M. disease.—E. M. J.

ROSENBUSCH, C. (1948.) Prevención de la fiebre aftosa, por medio de la vacuna intradérmica. [Foot and mouth disease control with the aid of an intradermic vaccine.]-*Rev. Fac. Med. vet., Lima*. 3. 32-38. 1247

A short review of F. & M. disease vaccination in which a favourable comparison is drawn between R.'s intradermic method and the subcutaneous method. Details are given of the use and technique of injection of R.'s vaccine.

—W. M. HENDERSON.

ESPINET, R. G. (1949.) Acerca del concepto de inmunidad en la fiebre aftosa a la luz de algunas comprobaciones experimentales. [Foot and mouth disease immunization.]-*Gac. vet., B. Aires*. 10. 7-22. [English summary.] 1248

Suspensions of plantar pad epithelium from g. pigs and tongue epithelium from cattle that had had F. & M. disease some months previously were used to inoculate groups of g. pigs in an attempt to recover virus. In each case, *i.e.*, three lots of g. pig material and seven lots of bovine material, a proportion of the g. pigs developed some sort of reaction at the sites of inoculation. E. concluded that these reactions were the result of "dormant" F. & M. disease virus in spite of there being no secondary lesions in any of some 50 "reactors", insufficient material for type determination for comparison with the original infection and no attempt to obtain this by passage. These equivocal results were then used as a basis for some theories about immunity to the disease.

—W. M. HENDERSON.

BASSET, J. (1948.) Vaccins anti-aphteux. À propos du "vaccin" Belin. [Vaccines for foot and mouth disease. With special reference to the Belin vaccine.]-*Bull. Acad. vét. Fr.* 21. 823-832. 1249

A strong condemnation of the Belin vaccine. [See *V. B.* 19. 480; & 20. 78.]

—W. M. HENDERSON.

CORTEZ. (1949.) Le vaccin de Belin (complexe vaccino-aphteux) dans la vaccination contre la fièvre aphteuse. [Belin's foot and mouth disease vaccine.]-*Bull. Acad. vét. Fr.* 22. 39-42. 1250

An outbreak of F. & M. disease in Algeria gave C. the opportunity of trying Belin's vaccine. A preliminary trial on 18 native cattle gave a favourable result but, as C. points out, these animals are usually somewhat insusceptible. When used on cattle imported from France—over 300

animals are mentioned in different groups—twice the normal dose of vaccine failed to protect animals exposed ten days later and any immunity that did eventually develop had disappeared within two months of vaccination. C. concludes that Belin's vaccine is of no use in practice.

—W. M. HENDERSON.

IYER, P. R. K. (1948.) Infectivity of the saliva of rabid herbivora.—*Indian Vet. J.* 25. 58-61. 1251

The author failed to transmit rabies to rabbits, by subdural inoculation of centrifuged and filtered saliva and mouth washings from a rabid horse. This contradicts the findings of Pawan [see *V. B.* 8. 363].—K. C. SINHA.

VOGEL, J., & DA SILVA, M. I. (1948.) Acidentes por vacinação antirrábica. [Accidents following rabies immunization in dogs.]-*Veterinaria, Brazil*. 2. No. 4. pp. 7-18. 1252

The authors discuss a non-contagious disease of dogs, which follows anti-rabic vaccination and which is characterized by the appearance of paralysis and other nervous disorders. In fatal cases, sections reveal the presence of a non-purulent lymphocytic meningo-encephalomyelitis. There are no Negri bodies present. One such case is described in great detail.—I. W. JENNINGS.

THOMPSON, R. L., WILKIN, M. L., HITCHINGS, G. H., ELION, G. B., FALCO, E. A., RUSSELL, P. B. (1949.) The effects of antagonists on the multiplication of vaccinia virus *in vitro*.—*Science*. 110. 454. 1253

A number of agents were examined for *in vitro* antagonism to the vaccinia virus. The authors inferred from their results the possibility that the proliferation of the virus occurs *via* a pathway which is blocked by diaminopurine but not by the folic acid derivatives.—L. M. MARKSON.

I. REJTHAR, E. (1949.) Chřipkové onemocnění hřebečků. [Influenza in young stallions.]-*Čas. československ. Vet.* 4. 87-89. 1254

II. NEUMANN, R. (1949.) Chřipkové onemocnění hřebečků. [Influenza in young stallions.]-*Ibid.* 90. 1255

I. R. reports on influenza in male foals kept in a state-owned foal depot in Bohemia during 1945-47. [Weaned foals are purchased yearly by the state and reared in depots until mature for stud and distribution.] Out of 181 foals acquired during 1945, 36 died of influenza. In 1946, out of a total not stated, 115 foals developed the disease and 19 died. Treatment with neosalvarsan, prontosil, bronchopneumin, galfagin, etc., failed.

The same year a vaccine prepared after Macek was used as a combined therapeutic and immunizing measure [dosage and particulars of vaccine not given], and no further cases were recorded. In



1947 all the 97 newly purchased foals were immunized against influenza and none developed infection.

In adult horses this vaccine was of therapeutic value only in the early stages of the disease.

II. N. took over the management of the depot in 1948. No further outbreaks occurred after systematic immunization with the vaccine. —E. G.

SULKIN, S. E., & IZUMI, E. M. (1947.) Isolation of Western equine encephalomyelitis virus from tropical fowl mites, *Liponyssus bursa* (Berlese).—*Proc. Soc. exp. Biol.*, N.Y. **66**. 249–250. 1256

In 1947 this virus was isolated from wild bird mites, *L. sylvarium*, in Kern County, California; in this work it was isolated in Dallas County, Texas, from similar mites collected from a nest of the English sparrow (*Passer domesticus*). A detailed account of the method of recovery and identification is given.

Additional attempts to demonstrate virus in 11 additional pools of species of wild bird mites, and also in fowl mites, were negative. It is thus becoming increasingly clear that other blood-sucking arthropods besides mosquitoes may be concerned in the transmission of this virus. The purpose of this report was to emphasize the importance of virus isolations from similar bird mites in two widely separated areas.—H. G. C.

BEARD, J. W. (1948.) The chemical, physical and morphological properties of animal viruses.—*Physical. Rev.* **28**. 349–367. 1257

B. summarizes and discusses the available information on the constitution, morphology, internal structure, ultracentrifugal characters, density, size, electrophoresis and stability of T<sub>2</sub> bacteriophage and the viruses of vaccinia, rabbit papillomatosis, equine encephalomyelitis (Eastern and Western strains), influenza (human types A and B and the swine type) and Newcastle disease. The current points of view of the nature of viruses are considered, *viz.* whether they are molecular entities or organisms. The physico-chemical findings discussed here leave the problem of the biological nature of infectious agents of this size as great as ever. No evidence has been presented confirming the belief that viruses may represent or be similar to "genes". The proportions of nucleic acid and consequently "genic" material in these animal viruses are, in general, smaller and in no case greater than those of organisms or cells. B. favours the concept that viruses contain a proportionate amount of determinative material set aside within the virus cell in a unit not differing fundamentally from the analogous units of other organisms. He deplors reference to these infective agents as nucleoproteins as being con-

fusing and misleading, such a term being no more warranted with respect to viruses than it would be to refer to a bacterium, a liver or an oyster as a nucleoprotein.—W. M. HENDERSON.

I. STECK, W. (1943.) Die klinische Diagnose der Anaemia infectiosa equorum. [Clinical diagnosis of equine infectious anaemia.]—*Schweiz. Arch. Tierheilk.* **85**. 431–443. 1258

II. STECK, W. (1945.) Probleme und Untersuchungen um die infektiöse Anämie der Pferde. [Equine infectious anaemia.]—*Mitt. naturf. Ges. Bern.* **3**. 41–52. 1259

III. STECK, W. (1946.) Studien über die infektiöse Anämie der Pferde. III. Auftreten von Zungenblutungen und Ausbreitung der Infektion. [Studies on equine infectious anaemia. III. Occurrence of haemorrhage of the tongue and spread of infection.]—*Schweiz. Arch. Tierheilk.* **88**. 61–80. 1260

IV. STECK, W. (1946.) Studien über die infektiöse Anämie der Pferde. IV. Weitere Beobachtungen über Zungenpunktblutungen und Ausbreitung der Infektion. [Studies on equine infectious anaemia. IV. Petechial haemorrhage of the tongue and the spread of infection.]—*Ibid.* **88**. 389–400. 1261

V. STECK, W. (1947.) Studien über die infektiöse Anämie der Pferde. V. Verlauf der Einzelerkrankung und der Enzootie. [Studies on equine infectious anaemia. V. Course of isolated cases and of enzooties.]—*Ibid.* **89**. 49–65. 1262

VI. STECK, W. (1946.) Nouvelles recherches sur l'épizootologie de l'anémie infectieuse des chevaux. [Epidemiology of equine infectious anaemia.]—*Bull. Acad. suisse Sci. med.* **1**. 454–459. 1263

VII. STECK, W. (1948.) Streptokokkenanämie und Vallée'sche Krankheit. [Streptococcal anaemia and equine infectious anaemia.]—*Schweiz. Arch. Tierheilk.* **90**. 165–176. [French summary.] 1264

I. Differential diagnosis of EIA is discussed. Haemorrhagic spots on the ventral surface of the tongue are not generally regarded as specific symptoms, unless present in great numbers in the form of very fine superficial haemorrhages. They occur most frequently several days after fever periods. Haemorrhagic spots, however, may be absent in otherwise typical cases. The sedimentation rate may be higher in fever free intervals.

In influenza the blood spots are less numerous, in petechial fever they are confined to the nasal mucosa and in other septicaemic diseases they are larger, more like patches and often elliptic in shape. In stomatitis they have the appearance of minute ulcers.



In cases of extreme weakness in the lumbar region caused by EIA, bladder and rectum are not paralysed and sensitivity is retained contrary to symptoms in spinal paralysis. Oedematous swellings occurring occasionally in EIA are not sensitive to touch and are of normal temperature. Anaemia as such is of no diagnostic value.

Intermittent fever in Switzerland is mainly the result of EIA. Mixed infections with strangles, TB., *Salmonella paratyphi* and *S. abortus-equi* occur quite frequently.—E. G.

II. It was not possible to elaborate a diagnostic method detecting characteristic changes in the serum of infected horses. In the course of the investigations it was found that by nephelometric measurement of the turbidity produced by serum in 200 times its volume of buffer solutions of pH varying from 4.6 to 5.6 (made up with M/80  $\text{Na}_2\text{HPO}_4$  and M/160 citric acid) turbidity graphs were obtained which differed in different individuals but were remarkably constant in some individuals for months.

It was found that in stables where infectious anaemia was present, the number of horses with numerous small sublingual haemorrhages (50 and more) was much higher (57.5%) than in stables without a history of infectious anaemia (14%). It appears that infection spreads more easily than was assumed, but that stable companions often have few symptoms (latent or semi-latent cases).

—W. STECK.

III. The technique of the examination of the tongue is described. Quiet fixation, good illumination, inspection with a magnifying lens besides spectacles, if necessary, are essential. Typical haemorrhages are generally small (smaller than  $\frac{1}{4}$  mm.) in diameter. They should not be confused with injected blood vessels and traumatic groups of punctiform haemorrhages and the region of the raphe should not be taken into account.

The typical haemorrhages show no relation to any disease but infectious anaemia where they are found also in the stable companions of clinical cases.

In experimental infection the haemorrhages may appear without any other clinical symptoms. Clinical observations suggest a transmission to stable companions during the incubation period and with a resulting mild or latent disease, whereas transmissions from a sick horse to one that has had no previous contact is apt to be dangerous.—W. STECK.

IV. Fifty or more sublingual haemorrhages were found in only a small percentage of horses that had had no contact with clinical cases of infectious anaemia, whereas in infected stables 57% of the horses had 50 or more such haemor-

rhages. In small villages the healthy horses with a positive result of the examination of the tongue are found in practically all the stables, not only in those stables where clinical cases had occurred.

—W. STECK.

V. Stable companions of apparently isolated cases of EIA contract a mild, often latent form of the disease which, although often overlooked, is of importance because of its immunizing value.

—E. G.

VI. This is a paper read at a meeting of the Swiss academy of medicine containing essentially the same information as part III.—W. STECK.

VII. S. states that the hypothesis that EIA and streptococcal anaemia may have similar symptoms was not proved experimentally, but he admits that mixed infections of both diseases occur. Virus anaemia as opposed to streptococcal anaemia is a regional disease. Horses infected with EIA should be separated from horses with streptococcal anaemia as soon as possible.—E. G.

LIGHT, J. S., & HODES, H. L. (1949.) **Isolation from cases of infantile diarrhea of a filtrable agent causing diarrhea in calves.—*J. exp. Med.* 90. 113-135.** [Authors' summary copied *verbatim*.] 1265

From instances of diarrhea of the newborn in four separate hospital outbreaks a filtrable agent was isolated which regularly produced diarrhea in calves. This agent appeared to have the characteristics of a filtrable virus. The four strains of virus isolated in the outbreaks studied appeared to be identical or very closely related. The virus was not found present in the stools of any of eight normal newborn infants or five normal calves.

Evidence is presented that the virus may be one of the causes of epidemic diarrhea of the newborn.

HELMBOLDT, C. F., & JUNGHER, E. L. (1950.) **The neuropathologic diagnosis of hog cholera.—*Amer. J. vet. Res.* 11. 41-49.** [Authors' summary copied *verbatim*.] 1266

The value of neuropathologic examination in the differential diagnosis of porcine diseases is discussed. Gross, microscopic, and bacteriologic, and, occasionally, animal inoculation tests on 124 diseased and normal specimens submitted during the past eleven years were supplemented by histologic examination of the brain at five cross-sectional levels.

Of 35 normal swine, 6- to 360-days old, 24 showed under, or near, the ependyma of the lateral ventricle both loose and compact cell aggregates which were found to be primarily composed of oligodendroglia and thus of ectodermal origin. These foci seemed to decrease in



number and intensity with advancing age and to have no pathological significance.

Of 31 uncomplicated hog-cholera specimens, the gray and white matter of the brain showed, in 28 instances, mesodermal reactions consisting of vascular and perivascular infiltrates, microgliosis, capillary hemorrhages, and leptomenigeal infiltrates, indicative of nonsuppurative encephalitis.

Of 13 hog-cholera cases complicated by salmonellosis, pasteurellosis, etc., on the basis of bacteriologic findings, 12 showed similar encephalitic lesions.

Of 23 cases presenting noninfectious disorders and 22 affected with various infectious diseases, only 4 cases showed isolated, barely recognizable, vascular infiltrates of no diagnostic importance.

Recognized infectious entities, such as erysipelas, pasteurellosis, salmonellosis, and hemorrhagic dysentery, which must be considered in the differential diagnosis of hog cholera, and successful hog-cholera vaccination, failed to induce the characteristic neuropathologic lesions.

Encephalitis changes have been described in Aujeszky's disease, Teschen disease, rabies, and listeriosis, none of which have been recognized in Connecticut. These diseases are believed to have been ruled out in this study on the basis of anamnesis, bacteriology, and animal inoculation tests. Thus, the encephalitic changes were interpreted as indicating hog cholera, which diagnosis was supported by virus isolation in 1 subtypical case, and by field observations on the effectiveness of simultaneous hog cholera re-vaccination.

Neuropathologic examination is considered to be a valuable aid in the differential diagnosis of porcine diseases.

RHOADES, H. E., & SUTHERLAND, A. K. (1948.) **Concurrent *Listerella monocytogenes* and hog cholera infections.**—*J. Amer. vet. med. Ass.* 112. 451-452. 1267

The authors record a case in a four-month-old pig of swine fever together with *Erysipelothrix* (*Listeria*) *monocytogenes* infection. No symptoms of encephalitis were seen.—D. LUKE.

BAKER, J. A. (1949.) Mesures préventives contre le hog choléra. [Methods of immunization against swine fever.]—*Bull. Off. Internat. Epizoot.* 32. 72-82. 1268

Preventive measures against swine fever are outlined and their prophylactic value in eradication programmes are assessed. None of the present methods are regarded as completely satisfactory. Serum treatment in conjunction with slaughter of infected pigs has been of distinct value in Canada where outbreaks are sporadic. It is felt that

the virus-serum method is of no value in total eradication owing to the residue of carrier pigs. Attenuated vaccines are limited by variability in strength, virulence and individual susceptibility. It is felt that rabbit attenuated vaccines offer the best protection, but further work is necessary with a view to obtaining strains adapted to other hosts or to chick embryos.—G. V. LAUGIER.

VENTURI, P. (1948.) Indagini epidemiologiche sul "Morbo di Teschen" e sulla trasmissibilità sperimentale dell'infezione. [Teschen disease. Epidemiology and experimental infection.]—*Zooprofilassi.* 4. 293-310. [English and German summaries.] 1269

In epidemiological studies it was found that Teschen disease occurs sporadically throughout Italy. In the author's own province of Treviso, 27 outbreaks were recorded in eight months. Clinically the disease is difficult to distinguish from others such as Aujeszky's disease, and histological tests should be carried out for confirmation. Where these are negative, the presence of Teschen disease cannot be excluded. The author therefore has tried to transmit the infection to experimental pigs, but without success. The number of animals used was very small and it was felt that further experiments on this line should be made.

A study of the epidemiology of acute poliomyelitis in man failed to reveal any close connexion with the incidence of Teschen disease in Treviso province.—I. W. JENNINGS.

CANESSA, S. (1948.) Il morbo di Teschen nel Modenese. [Porcine encephalomyelitis (Teschen disease).]—*Nuova Vet.* 24. 381-385. 1270

C. describes the clinical symptoms and P.M. lesions in Teschen disease and its differentiation from swine fever, Aujeszky's disease and haemorrhagic septicaemia. He succeeded in producing symptoms of encephalomyelitis in two out of four rabbits, after subcutaneous injection of catarrhal exudate from the intestine of natural cases. The rabbits died in two days after the development of symptoms. One control rabbit developed identical symptoms and died also, possibly as a result of spread of infection from the two artificially infected rabbits.—I. W. JENNINGS.

KODRNJA, E. (1949.) Imunizacija prasadi protiv zarazne uzetosti s adsorbat vakcinom. Od koje dobi života sisančad postaje sposobna vakcinacijom stvarati imunitet protiv zarazne uzetosti. [Immunization of piglets against Teschen disease with adsorbate vaccine.]—*Vet. Arhiv.* 19. 1-13. Abst. from French summary.] 1271

Groups of pigs between 15 and 60 days old were vaccinated and one month later the immunity was tested by intracerebral inoculations of virus.



Of the groups vaccinated between 45 and 60 days old approximately 73% resisted the test dose of virus. Of the groups vaccinated before 45 days the number which had developed a satisfactory immunity was lower and varied with the age of the pigs at vaccination. Prophylactic vaccination on the 45th day is recommended. Where younger pigs are directly threatened by infection it may be anticipated that 50% of those vaccinated between 30 and 45 days will have a solid immunity. In younger pigs a satisfactory immunity is not established with this vaccine.—D. LUKE.

GWATKIN, R., PLUMMER, P. J. G., BYRNE, J. L., & WALKER, R. V. L. (1949.) **Rhinitis of swine.**

III. Transmission to baby pigs.—*Canad. J. comp. Med.* 13. 15-28. 1272

Nasal washings from adult pigs affected with rhinitis instilled into the nostrils of piglets caused the complete or partial disappearance of the turbinated structures in the latter in approximately 30 days. Washings from these piglets reproduced the condition in healthy piglets. Filtrates of active washings, sterile broth, normal pig and human nasal washings, the fourth and sixth chick embryo passages of two lots of active washings and normal embryo fluids proved innocuous for the turbinates of piglets. In the authors' opinion, the aetiological agent's infectiousness was suggested by the loss of turbinated bones in some of the non-instilled contact pigs and by the apparent lack of influence of the number of instillations on the end result. Histopathological findings were negative and bacteriological examinations which included agglutination tests on serum of affected pigs with antigens prepared from some of the isolated bacteria suggested that the aetiological agent was not of a bacterial nature. Suitable staining techniques failed to demonstrate the presence of any *Rickettsia* and tests on the nasal washings for a haemagglutinating virus of the influenza type indicated that such a virus was not present in detectable amounts.

BAY, W. W., HUTCHINGS, L. M., DOYLE, L. P., & BUNNELL, D. E. (1949.) **Transmissible gastroenteritis in baby pigs.**—*J. Amer. vet. med. Ass.* 115. 245-248. 1273

Eighty piglets 1-5 days old were fed with material from affected pigs as follows:—58 with gastro-intestinal tract, four with liver, four with kidney, four with brain, six with spleen, two with heart and two with lung. Evidence of positive transmission occurred in all cases except the two piglets given heart material and two of the six piglets exposed to spleen material.

Of 34 piglets fed gastro-intestinal tract filtrate, 30 developed symptoms of disease. Two of four piglets fed 8 ml. of a 1 : 1,000,000 dilution

of gastro-intestinal tract material developed the disease. There was also evidence of resistance to the disease in piglets more than nine days old. The causal agent was killed by exposure to temperatures of 55°C. for 30 min. and by 0.5% phenol. Streptomycin and sulphamethazine given at the time of exposure had no effect on the course of the disease.—D. LUKE.

BODINGBAUER, J. (1949.) **Die Staupe-Schmelzhypoplasien (Staupegebiss) des Hundes. [Hypoplasia of the enamel in dog distemper.]**—*Schweiz. Arch. Tierheilk.* 91. 84-116. 1274

For those interested in animal dental pathology particularly in relation to the occurrence of dental complications in distemper infection this article should be read in the original. The literature dealing with the occurrence of dental abnormalities in distemper and rickets in dogs is reviewed; there is brief reference to enamel hypoplasia in other animals, and to experimental work with dogs such as that of Mellanby. The pathological changes which occur in the teeth of dogs infected with distemper are described and very clearly illustrated. A tabular survey of incidence is given.

Following distemper infection there is circulatory disturbance in the tooth pulp with exudation and oedema which affects the proper functioning of odontoblasts and ameloblasts. The architecture of both enamel and dentine may therefore have a faulty foundation. The relationship to distemper in so far as pathogenesis is concerned is uncertain but it is not solely the result of fever. The role of enamel hypoplasia in the production of caries is discussed. Mineral supplements have both a therapeutic and prophylactic value.—J. R. M. I.

WHITTEM, J. H., & BLOOD, D. C. (1949.) **Hepatitis contagiosa canis (Rubarth) in Australia.**—*Aust. vet. J.* 25. 166-171. 1275

In the course of an investigation of canine encephalitis the disease known as hepatitis contagiosa canis was encountered for the first time in Australia. Detailed clinical and pathological findings of this spontaneous case are recorded, together with the findings in five puppies which were experimentally infected with the disease.

—N. WICKHAM.

SIEDENTOFF, H. A., & CARLSON, W. E. (1949.) **A comparative study of the fox encephalitis virus and the virus of infectious canine hepatitis.**—*J. Amer. vet. med. Ass.* 115. 109-111. 1276

Hepatitis contagiosa canis, originally described by RUBARTH in Sweden [see *V. B.* 18. 369], is now an established pathological entity in dogs and from what is now known has clearly been confused with many other diseases. Green clarified the problem of fox encephalitis and showed that



the virus was distinct from distemper and suggested that de Monbreun in his work on experimental distemper had been actually using fox encephalitis virus. Rubarth suggested that the latter virus was the same as that causing canine hepatitis. The experiments reported here are of importance, for they offer proof of the latter contention. Both viruses (fox encephalitis and contagious hepatitis) possess the same infective potency; the inclusion bodies formed in the endothelial cells lining the interior surface of the cornea cannot be differentiated. Serum produced by repeated injections of either virus will neutralize the other. The two viruses therefore have common antigenic properties.—J. R. M. INNES.

SAXER, E. (1948.) Beobachtungen über die infektiöse Enzephalitis bei Fuchs und Hund. [Infectious encephalitis in foxes and dogs.]—*Schweiz. Arch. Tierheilk.* 90. 565–582. 1277

General comments are made regarding the types of viruses affecting the nervous system according to the classification and work of Seifried. The distemper virus is regarded as one which occasionally affects the nervous system. The complexity of the canine encephalitis problem and the increasing frequency with which nervous cases were encountered during the late war is mentioned. A brief historical account of the work by Green and his colleagues on fox encephalitis is given followed by a detailed clinical and pathological investigation of an outbreak of encephalitis in foxes investigated by the author. Differential diagnosis of distemper and fox encephalitis virus infection is summarized. An account of an outbreak of encephalitis in hunting dogs is given which was considered to be typical fox encephalitis virus infection. The observations are all of interest and importance, for the paper was evidently written before the work of RUBARTH [see *V.B.* 18. 369] and of MACINTYRE *et al.* [*V.B.* 19. 401] completely revolutionized previous concepts regarding virus diseases of dogs affecting the nervous system.—J. R. M. INNES.

CORDY, D. R. (1949.) Interstitial pneumonia with giant cells and inclusions.—*J. Amer. vet. med. Ass.* 114. 21–26. 1278

Report on two cases of interstitial pneumonia with inclusions and giant cells in a distemper-like disease of dogs, and a comparison with the exudative bronchopneumonia often seen in field cases of distemper. C. interprets the presence of both cytoplasmic and nuclear inclusions as indicating the presence of distemper virus, the pneumonia being uncomplicated by secondary infection.—L. M. MARKSON.

BRION, A., & BERTRAND, M. (1948.) Atténuation du virus de la leucopénie infectieuse des chats.

[Attenuation of the virus of feline infectious enteritis.]—*C. R. Soc. Biol., Paris.* 142. 938–934. 1279

To attenuate the virus of feline enteritis the authors add 0.5% formol and 0.5% glycerin to a 5% suspension of infected liver and spleen. The mixture is incubated at 37°C. for two days, then kept in the refrigerator for eight days. In a second method, the glycerin is omitted.

Both suspensions were found to be innocuous and to retain their antigenic powers. For protection of susceptible cats, the authors use two injections of 2.5 ml. of the suspension, with an eight-day interval between. Immunity develops 15 days after the first injection, but it is difficult to assess its durability, owing to the numerous opportunities for natural infection, which reinforce the artificial immunity.—I. W. JENNINGS.

BENTINCK-SMITH, J. (1949.) Feline panleucopenia (feline infectious enteritis). A review of 574 cases.—*N. Amer. Vet.* 30. 379–384. 1280

A study of 574 clinical cases of feline panleucopenia. No new knowledge.—I. W. J.

MCKERCHER, D. G. (1949.) Immunization studies in cats against *Miyagawanella felis*.—*Thesis, Cornell.* pp. 50. 1281

Vaccines against *M. felis* containing viable and inactivated elementary bodies were prepared from infected egg membranes and fluid, and from infected mouse lung. Evidence is submitted which indicates that most preparations conferred a measure of protection on the majority of cats vaccinated. Viable unpurified vaccines were proved to be superior to those that consisted of purified suspensions of either viable or inactivated elementary bodies.—H. L. GILMAN.

DAVENPORT, F. M. (1949.) Multiplication of pneumonia virus of mice (PVM) in the rabbit lung and the demonstration of a hemagglutinating component in lung suspensions from normal animals.—*J. Immunol.* 63. 81–91. [Author's summary copied *verbatim*.] 1282

Multiplication of PVM in the rabbit lung after intratracheal inoculation has been demonstrated. The virus was maintained through eleven serial passages in rabbit lungs. The development of a hemagglutinating component (RHC) in heated suspensions of rabbit lungs upon prolonged storage at 4°C is described and various properties of the component are enumerated. There is a close similarity between the hemagglutination reactions of RHC and PVM. The differences between RHC and hemagglutinating components previously found in other animal tissues are discussed. The available evidence suggests that RHC is a complex substance of large size which contains phospholipid and indicates



that the lipid is essential for hemagglutinating activity.

JACOTOT, H., & VALLÉE, A. (1949.) Peste aviaire ou maladie de Newcastle? [**Newcastle disease in France.**—*Bull. Acad. vét. Fr.* 22. 186–188. 1283

Fowl plague has recently been reported from different parts of France. Material from one outbreak was submitted to the Veterinary Laboratory at Weybridge, England, and the infective agent proved to be of the Newcastle disease type.

—D. LUKE.

KUNST, H. (1949.) **The differences between Newcastle disease and fowl plague.**—*Tijdschr. Diergeneesk.* 74. 403–412. [In English.] 1284

Six mice were injected intracerebrally with 0.05 ml. of undiluted Newcastle disease allantoic fluid and five died in 4–12 days. A suspension of the brain of one of these mice was injected into three healthy mice, but none died. Six more mice were inoculated intracerebrally with blood from a chicken which had died of fowl plague, and two died after seven days. Two of three mice injected with a second passage died after five days, and after seven passages, all mice died regularly after three days. Experiments on cross immunization in mice were also made. As a result of these experiments and a study of the literature, K. concluded that the two diseases are not related.

—J. O. L. KING.

BEAUDE, F. R., BIVINS, J. A., & MILLER, B. R. (1949.) **A comparison of filtration and antibiotic treatment for the recovery of Newcastle virus from spontaneous cases.**—*Amer. J. vet. Res.* 10. 92–95. 1285

Respiratory exudates from 58 fowls were examined for virus. Broth was mixed with each sample and centrifuged. Part of the supernatant fluid was filtered and the filtrate used to inoculate embryonated eggs. The remainder of the supernatant fluid was treated with a solution of penicillin and streptomycin before inoculating the eggs.

Of the 58 samples examined virus was found in 38. Only 16 filtrates were positive, whereas 36 of the antibiotic treated samples yielded virus. In 14 samples both the filtrate and the antibiotic treated samples were positive. In two the filtrate was positive and the antibiotic treated material was negative; in 22 samples the filtrate was negative, but the antibiotic treated material was positive. Twenty samples were negative with both treatments.—D. LUKE.

MOSES, H. E., BRANDLY, C. A., JONES, E. E., & JUNGHER, E. L. (1948.) **Immunization of chickens against fowl plague.**—*Amer. J. vet. Res.* 9. 399–420. 1286

The strains of virus used in this laboratory

investigation were a Dutch East Indies strain and two of its variants. Virus exposed to formalin and ultra-violet light and with oily adjuvants added was used for vaccine production. The distribution of virus in the embryo and its fluids was examined.

The immunizing response to the various vaccines was in the following descending order :—(a) inactivated virus followed after some months with living virulent virus; (b) living variant virus; (c) inactivated adjuvant vaccine; (d) inactivated non-adjuvant vaccine. Neither age, breed nor sex had any effect on the response to vaccination.

An immunity of practical value persisting for 18–21 weeks (longest period studied) followed vaccination with whole egg adjuvant vaccine and with living variant virus.—D. LUKE.

DELAFLANE, J. P. (1949.) **Progress in infectious bronchitis research.**—*J. Amer. vet. med. Ass.* 115. 257–258. 1287

A review of the literature on infectious bronchitis in poultry.—D. LUKE.

DAVIS, D. J., & VOGEL, J. E. (1949.) **Recovery of psittacosis virus from chicks hatched from inoculated eggs.**—*Proc. Soc. exp. Biol., N.Y.* 70. 585–587. 1288

The authors inoculated 1,018 chick embryos, at various stages of development, either in the yolk sac or in the allantoic cavity, with a strain of psittacosis virus. Of the 358 chicks that hatched 304 were examined for the presence of virus by the inoculation of spleen, liver and kidney suspensions, intracranially into mice. Virus was detected in 12.5% of the hatched chicks. Half the isolations were made from chicks, examined within 24 hours of hatching and the percentage of positive isolations decreased with the age of the chicks. The oldest chick in which virus was found was 22 days. Apart from some of the chicks examined within 24 hours of hatching, which were moribund, all the chicks appeared healthy.

These results suggest that, in susceptible species of birds, the virus of psittacosis may be transmitted congenitally.—ANGUS FOGGIE.

SHEW, D. I. (1949.) **Effect of calcium on the development of streptococcal bacteriophages.** [Correspondence.]—*Nature, London.* 164. 492–493. 1289

Calcium is essential for development of staphylococcal and coliform phages and *S.* demonstrated that it is also essential for the bacteriophages which attack the lactic streptococci used as cheese starters and for eight phages of *Streptococcus cremoris*. The stimulatory effect of the calcium can be removed by the addition of citrate.

The optimum amount of calcium chloride is 0.02–0.07 M depending upon the amount of



phosphate in the medium. Magnesium ions do not replace calcium.—MALCOLM WOODBINE.

STEINHAUS, E. A. (1949.) **Nomenclature and classification of insect viruses.**—*Bact. Rev.* 13. 203–223. [Author's recapitulation copied *verbatim*.] 1290

Recent attempts to devise a satisfactory system of classifying plant and animal viruses have made it necessary to give further consideration to the systematic aspects of insect viruses if they are not to be left behind in the development of virus taxonomy. To assist in bringing this about, the writer has followed his previous proposal that the known insect viruses be separated provisionally into at least four generic groups (*Borrelina*, *Paillotella*, *Bergoldia*, and *Morator*) according to the type of inclusion body formed in the tissues of the diseased host, and the type of disease produced. In the present paper these groups have been further delineated, descriptions of species have been revised, and the following new species named: *Borrelina olethria*, *Borrelina campeoles*, *Borrelina peremptor*, *Bergoldia daboia*, *Bergoldia lathetica*, and *Bergoldia thompsonia*.

Although more than a hundred different insect hosts are known to be susceptible to probably as many different viruses, it is suggested that in the future no name be given to a virus until the agent has been demonstrated by physical or visual means in such a manner that at least its approximate size and shape are known. For instance, all new species described and named in the present paper have been demonstrated at least with the electron microscope. It is further recommended that the properties and characteristics of those insect viruses contained within inclusion bodies be determined on the basis of tests on the free virus rather than, as in the past, on the virus protected by the inclusion.

As the techniques of virus research are refined the characteristics and properties of the insect viruses will undoubtedly become more accurately known. The keys, descriptions, and groupings proposed in this paper are advanced as suggestions that may assist future virus systematists in better appraising the several kinds of viruses which cause infections in insects.

VARGUES, R. (1949.) **Intérêt de la technique cutanée dans le dosage comparé des rickettsies. [Intradermal tests in titration of rickettsia.]**—*Ann. Inst. Pasteur.* 76. 462–465. 1291

This is a study of the effect of the suspending fluid on the intradermal titration of rickettsia.

100 mg. quantities of ground up mouse lung were added to 2 ml. of each of the following 12 suspension fluids: distilled water, normal saline, Sørensen's buffer pH. 7·6, Tyrode solution, 5%

isotonic glucose solution, 30% glucose solution, nutrient broth, milk, 10% egg albumen in distilled water, 10% egg yolk in distilled water, rabbit serum and human serum. After thorough shaking the suspensions were left at room temperature for 2½ to 3 hours; 0·2 ml. of each suspension was then inoculated intradermally into the skin of the back and flanks of a rabbit. At the fourth day the diameter and height of the reaction papule was measured at each injection site. The resulting figures indicated that milk, egg yolk and broth were the best preservative media; buffer solution, Tyrode solution, distilled water and the sera were not so good; and saline, the glucose solutions and egg albumen were the worst. In a rabbit injected with the fluids alone, no lesions were visible at the fourth day.

Further quantities of the same suspensions were freeze-dried and, after 20 days, were resuspended in distilled water. On injecting test rabbits it was found that the reactions, apart from a general drop resulting from freeze-drying, corresponded closely to the results obtained with the undried suspensions.

In a third set of experiments, the dried suspensions were resuspended in milk and again a close correlation existed between the reactions of the original suspensions and the resuspended material. Three different strains of *Rickettsia prowazeki* gave exactly similar results.

From these experiments the author concludes that, (1) for the preservation of strains of typhus by freeze-drying, suspensions in liquids such as milk, dilute egg yolk or nutrient broth are most suitable; and (2) the reaction produced by intradermal injection in the rabbit is solely a function of the number of virulent rickettsia present and not of the suspending fluid.—ANGUS FOGGIE.

GILES, H. MCC., & SYMINGTON, T. (1950.) **Chloromycetin in scrub-typhus.**—*Lancet.* 258. 16–19. [Authors' summary and conclusions copied *verbatim*.] 1292

Sixteen cases of scrub-typhus in British, Gurkha, and Chinese soldiers in Malaya are reported. Each patient was given one dose of 3 g. of synthetic chloromycetin; fifteen responded fully and required no further treatment. One patient did not improve within 10 hours, and was given an additional 2·25 g. of chloromycetin, after which he made a rapid recovery. In the light of these results it is suggested that the routine treatment of scrub-typhus need consist of no more than a single dose of 3 g. of chloromycetin. If, however, obvious improvement is not apparent within 10–12 hours an additional dose of 1 g. should be given, followed by 0·25 g. 3-hourly to a total of about 6 g.

MORLAN, H. B., HILL, E. L., & SCHUBERT, J. H.



(1950.) Serological survey for murine typhus infection in southwest Georgia animals.—*Publ. Hlth Rep., Wash.* 65. 57–63. [Authors' summary copied *verbatim*.] 1293

In a limited survey of southwest Georgia animals, exclusive of domestic rats, 3,202 sera from 87 species were examined by the complement

fixation test for murine typhus. A low level of natural infection was indicated by the finding of 47 positive sera from 12 species of animals including the opossum, cottontail, fox squirrel, house mouse, rice rat, cotton mouse, old-field mouse, cotton rat, dog, Florida skunk, weasel, and blue jay.

See also *absts.* 1297 (rabies); 1381 (fowl pox); 1408 (equine infectious anaemia); 1460 (sewage sludge); 1513 (India, report); 1514 (Nyasaland report); 1515–1516 (Denmark, reports); 1518 (U.S.A., report); 1519 (F.A.O., report).

## IMMUNITY

STRATTON, F. (1950.) Some observations on antigen-antibody reactions.—*Lancet.* 258. 247–249. [Author's summary copied *verbatim*.] 1294

A method is described of using an immune hen rabbit serum with sensitised sheep cells as an indicator to detect rabbit serum. The test is shown to be specific.

Using a well-known haemolysin, like the sheep-cell one, it can be demonstrated that when sensitised sheep cells are suspended in a suitable antiserum the reaction is one of agglutination, and this is compared with the agglutination by Coombs reagent of the sensitised erythrocytes from a baby with haemolytic disease of the newborn.

This system may be useful in the detection of rabbit serum absorbed on to the tissues of another animal.

SMITH, A. U. (1949.) Some antigenic properties of mammalian spermatozoa.—*Proc. roy. Soc. Ser. B.* 136. 46–66. [Author's summary copied *verbatim*.] 1295

Methods of testing sera for precipitins against seminal proteins, and for spermatozoal agglutinins are described.

The influence of various factors on agglutination of rabbit and guinea-pig spermatozoa in hanging drop preparations has been investigated. In diluted normal sera agglutination of spermatozoa by their tails occurred rarely, and then only in low serum dilutions. In the sera of immunized animals tail agglutination commenced within 10 sec., and titres could be read after 20 min. Altering the pH of the diluent below 7.0, or above 8.1, reduced the serum titres. Washed spermatozoa from semen or from the epididymis were agglutinated to higher serum titres than unwashed spermatozoa from the same specimens. A fourfold increase in the concentration of unwashed rabbit spermatozoa, and an eightfold increase in the concentration of washed rabbit spermatozoa halved the serum titre. Additions of complement did not, in the proportions used, alter the agglutination titres of antisera or the motility of the spermatozoa.

The agglutination of rabbit spermatozoa is inhibited by fluid from the vagina. It can be

reversed by mechanical means, or by addition of fresh spermatozoa in excess. With guinea-pig spermatozoa disagglutination has been achieved by mechanical methods only.

Mixed agglutinates of spermatozoa of different species can be produced by antisera which agglutinate them separately.

McDOUGALL, E. I. (1949.) An immune globulin fraction from bovine precolostrum.—*Biochem. J.* 44. 531–541. 1296

Chemical and electrophoretic studies of the easily salted-out fraction of pre-colostrum obtained from heifers at about half term show that it contains a high proportion of euglobulin and pseudoglobulin I. Using the presence of the agglutinin to *Br. abortus* as a guide, attempts were made to isolate an immune globulin found to be present in the pseudoglobulin fraction. The immune globulin isolated was, however, considered not to be biologically pure as it consisted of a major component and one or perhaps two minor components. The main component was found to be very similar to the T-component of bovine plasma, so that it probably arises from the blood. It is concluded that an adequate dry period between calvings is essential in order that immune globulins will have time to collect in the udder.—J. A. NICHOLSON.

MACE, D. L., & CORTEZ, F. S. (1949.) Immunity status of normal, vaccinated, and rabid animals.—*J. Amer. vet. med. Ass.* 115. 24–30. 1297

Observations made at the Manila City Pound and independently by the authors indicated that rabies may be primarily a disease of young dogs. Complement-fixation and virus neutralization tests were used to determine the immunity status of normal, vaccinated and rabid animals, and whether dogs develop an immunity to the disease. The prophylactic value of rabies vaccine was also investigated.

The preparation of three rabies antigens and the techniques of the various tests are described. The test animals in the neutralization experiments were white mice 18–30 days old, four mice being used for each virus dilution. Dog serum was found to be frequently anticomplementary in



complement-fixation tests with two of the rabies antigens. It was implied that the antigens had been rendered non-specific by some factor present in dog serum but not in human, rabbit, g. pig or mouse serum.

Serum-virus neutralization tests revealed that a high percentage (45%) of the sera of non-vaccinated dogs (51 dogs) possessed high neutralization indices. This suggested that a degree of immunity may result from the natural exposure to virus of dogs which do not develop clinical disease. There was no evidence of immunity being acquired with age. Seven dogs were given 14 daily injections of rabies vaccine, blood being withdrawn periodically for neutralization tests. A marked antigenic response occurred between 9 and 14 days from the outset, but the greatest response was between the 21st and 26th days. The effectiveness of vaccine treatment given to dogs previously exposed to virus might thus be demonstrated. The incubation period of the disease in dogs inoculated with virus into the masseter muscles averaged 17 days, and into the muscles of the hind leg 19 days. It was doubtful, therefore, whether the 9-14 day response would be sufficient to prevent terminal infection in animals treated after virus exposure, and solid immunity was not maintained for longer than six months.—C. A. E. BRIGGS.

EHRICH, W. E., DRABKIN, D. L., & FORMAN, C. (1949.) Nucleic acids and the production of antibody by plasma cells.—*J. exp. Med.* 90. 157-168. [Authors' summary copied *verbatim*.] 1298

A study has been made of the relationship of antibody formation and the changes in amount of the nucleic acids in rabbit lymph nodes draining areas injected with typhoid vaccine.

The increase in DNA [desoxyribose nucleic acid] was found to parallel the increase in weight of the nodes, as might be expected from the active multiplication of cells.

The peak of PNA [ribose nucleic acid] increase occurred between the 4th and 6th days after vaccine injection when antibody formation was at its maximum.

A histological study of methyl green- and pyronine-stained sections of the nodes revealed that during the first 6 days of the experiment the cellular reaction was chiefly one of plasma cells. During the first 3 days plasmoblasts predominated; on the 5th and 6th days mature plasma cells were the prevailing cells. Most of the PNA was contained in the plasma cells.

The lymphocytes began to proliferate in significant numbers on the 3rd and 4th days, and germinal centers began to appear on the 4th and 5th days. They showed their greatest activity only

on the 9th day when PNA and antibody formation had passed their peaks.

These results are interpreted as indicating that the plasma cell and not the lymphocyte is responsible for antibody formation.

BRION, A. (1949.) Sur l'ictère hémolytique du poulain nouveau-né. [*Haemolytic icterus in new-born foals.*]—*Rev. Méd. vét., Lyon et Toulouse.* 100. 229-235. 1299

The work of BRUNER, HULL, EDWARDS and DOLL in America [see *V. B.* 19. 282] is reviewed at length and attention is drawn to the horse blood groups. Three cases are presented. In the first, it was found that a mare, after giving birth to icteric foals, can bear healthy foals if they are sired by a stallion the red cells of which are not agglutinated by the mare's serum. The remaining two cases demonstrated that foals of immunized mares may be reared successfully by artificial feeding for the first few days of life, the foals being returned to the mare's udder when the antibody in the milk has disappeared. In the third case the icteric foal was the first offspring of the mare.—G. F. R.

BRION, A., & GORET, P. (1949.) Les échanges immunitaires entre la mère et le fœtus ou le nouveau-né. Conséquences et applications à l'étiologie et à la pathogénie de l'ictère hémolytique du mulet et du poulain. [*Transfer of immunity from dam to foetus in relation to icterus in new-born foals and mules.*]—*Rev. d'Immunol. Therap. antimicrob.* 13. 325-337. 1300

In this review the authors discuss the permeability of the placenta. This may vary in the first place with the species, depending upon the numbers of layers of tissue interposed between the foetal and maternal circulations. The least permeable placentas are those of the mare, sow, cow and goat (seven layers) and the next group includes the sheep (five layers). The third group comprises the dog, cat, wolf and jackal (four layers) while the most freely permeable placentas are found in rodents and primates (one layer). In addition to species differences the placenta may be diseased or defective so as to become abnormally permeable and this may arise with an unnaturally prolonged gestation.

The passage of antigens across the placenta is generally not experienced and probably results only from placental defect. The passage of antibodies, on the other hand, is the rule in the last two groups mentioned above. In the first two groups, however, the antibodies are transferred in the colostrum and may be absorbed unaltered through the new-born animal's intestinal mucosa for at least the first 36 hours of life.

The authors review the condition of icterus

in new-born mules and foals. The disease occurs spontaneously in the Poitou district where it was observed that many new-born foals after appearing healthy at birth, deteriorated about 12 hours later, weakening, failing to feed, lying down and subsequently becoming jaundiced, with haemoglobinuria and an increased respiration rate. The foal was seldom the first-born and usually followed several healthy offspring, although once the mare had borne an icteric foal, the subsequent offspring were usually affected. It is said that a pathognomonic sign of jaundice in the foal is a premature lactation in the mare.

The aetiology of the condition is an iso-immunization of the mare against red cells of the foal which contain an incompatible antigen derived from the stallion. Agglutination tests with the serum of the affected mare result in agglutination of the stallion's and foal's cells but not those of the mare; serum from normal mares does not agglutinate the cells of any of these.

After speculating on how the antigen passes from the foetal to the maternal circulation, the authors conclude that a premature separation of the placenta occurs which would permit the passage of the antigen and account both for the mare coming into lactation before parturition and for the weakly appearance of the foals. [There is as yet no evidence to support this theory.]

The authors reject the concept of the antibody being transferred across the placenta and support, with three illustrative cases, the hypothesis that it is transferred in the colostrum.—G. F. R.

WAGLEY, P. F., & CASTLE, W. B. (1949.) **Destruction of red blood cells. VII. Apparent autosensitization to dog red blood cells.**—*Proc. Soc. exp. Biol.*, N.Y. 72. 411-413. 1301

An attempt was made to immunize four dogs against their own red blood cells. During the experiment the following estimations were regularly made; red cell count, white cell count, reticulocyte response, haemoglobin, haematocrit, icterus index, and osmotic and mechanical fragility. In addition complement titrations were undertaken, and complement-fixing antibodies, and warm and cold agglutinins were sought.

One pair of dogs received their own blood after it had been frozen, thawed and incubated with streptococcal toxin (it was administered intraperitoneally every two days for 14 injections). The other pair received their blood treated similarly except that a broth culture of haemolytic *Staphylococcus aureus* replaced the streptococcal toxin, and the mixture was Seitz-filtered and frozen before use. No significant changes in the values determined were found in any of the dogs during the injection period or for 18 days thereafter.

All four dogs then received a subcutaneous injection containing their own washed packed red cells (1 ml.), a mineral oil, a lanolin-like substance and 1 mg. of heat-killed *Mycobacterium tuberculosis*. Again no changes were detected for six weeks. Each dog was then injected again with this mixture, to which, after it had been heated to 57°C. for two and a half hours and cooled, had been added 2 ml. of fresh pig serum. In three of the dogs there were no changes, but the red cells of the fourth in eight observations made between the 25th and the 35th days after injection were agglutinated by a rabbit anti-dog serum. No other abnormalities were detected and the cells were no longer agglutinable after the 35th day.

—G. FULTON ROBERTS.

FISHER, S. (1948.) **Inhibition of vaccinia haemagglutination by protamine and histones.**—*Aust. J. Sci.* 11. 27-28. 1302

Protamines and histones alone are capable of causing haemagglutination, but when mixed in appropriate dilutions with vaccinia virus, no haemagglutination of the test cells occurs on account of mutual neutralization of the two haemagglutinins.

As these substances are basic proteins and apparently combine with the vaccinia haemagglutinin to prevent its attachment to the erythrocyte surface, it is suggested that the receptor for vaccinia on the surface of the susceptible fowl erythrocyte is also a basic protein.—N. WICKHAM.

DALTON, D. J. (1949.) **The eosinophil leucocyte, eosinophilia, and allergy. A hypothesis.**—*Lancet*. 257. 607-609. 1303

A brief discussion of the literature forms the basis of D.'s argument that eosinophile polymorphonuclear leucocytes are chemotactically attracted to antibodies, and their production stimulated. Antigen-antibody reactions with breakdown of eosinophiles will release their histamine at the site of antigen invasion. Local capillaries are rendered permeable to antibodies by histamine. The process continues in this way until all the antigen has been neutralized.

—L. M. MARKSON.

CASTELLI, D., & DESTEFANIS, E. (1949.) **Sull'azione antiallergica della nicotamide. [The anti-allergic action of nicotamide.]**—*G. Batt. Immun.* 40. 193-204. [English, French & German summaries.] 1304

G. pigs were sensitized to horse serum, and at various times before the administration of the challenging dose they were given injections of nicotamide.

It was found that nicotamide, whether given in single or multiple injections, did not influence the formation of antibody, nor did it influence the



passive transfer of anaphylaxis. If it were injected in such a way as to produce a high level in the blood when the challenging dose was given, then anaphylactic shock was completely inhibited or markedly attenuated.

The authors believe that this anti-allergic action is due to the fact that the high oxidation-reduction potential of nicotamide causes a rapid change of the histamine generated in the antigen-antibody reaction, from the active to the non-active state.—I. W. JENNINGS.

KOPELOFF, L. M., & KOPELOFF, N. (1949.) **A delayed chronic inflammatory reaction at an antigen depot in the guinea pig, effected by systemic sensitization.**—*J. Immunol.* **62.** 363–374. [Authors' summary copied *verbatim*.] 1305

A delayed chronic local inflammatory reaction has been induced in the hind foot of the guinea pig by the simultaneous injection of an antigen-adjuvant emulsion with or without killed tubercle bacilli into the nuchal region, and of the same antigen without adjuvants into the hind foot. Normal rabbit serum, normal horse serum, rabbit anti-rat organ antiserums, therapeutic horse serum preparations, and crystalline chicken ovalbumin served as effective antigens. A chronic arthritic deformity of the foot followed the acute phase. The presence of killed tubercle bacilli in the antigen-adjuvant mixture enhanced the subsequent inflammatory response. It would appear that this phenomenon is an antigen-antibody reaction at a second depot of antigen, in which sensitivity of the tuberculin type may play a significant rôle.

It is suggested that the mechanism responsible for the production of experimental allergic encephalomyelitis may be similar in nature to that involved in the local reaction described above.

HARRIS, T. N., & HARRIS, S. (1949.) **Histochemical changes in lymphocytes during the production of antibodies in lymph nodes of rabbits.**—*J. exp. Med.* **90.** 169–180. [Authors' summary copied *verbatim*.] 1306

Following the injection of various antigenic and non-antigenic materials into the foot-pads of rabbits, the draining (popliteal) lymph nodes were removed on successive days and studied histologically, chemically, and serologically. On the 2nd day after injection of antigen, nucleoli and cytoplasmic granules and crescents stained with pyronine began to appear. They were found first in somewhat altered reticulum cells, later in transitional forms, then in young lymphocytes, and finally in more mature lymphocytes. The identity of this pyronine-stained material as ribonucleic acid was demonstrated by specific digestion with protease-free ribonuclease.

The concentration of ribonucleic acid was determined in aqueous extracts of the lymph nodes. It was observed that the concentration had risen to more than twice its normal value by the 2nd to 5th day following the injection of antigens into the foot, and then it declined. The peak of this change occurred at or slightly before the appearance of the maximal concentration of antibodies in the same node.

Non-antigenic materials, when injected into the foot, did not give rise to an increase in the ribonucleic acid content of the lymph node.

The concentration of desoxyribonucleic acid was constant in all lymph nodes, within the limits of experimental variation.

TALIAFERRO, W. H. (1948.) **The inhibition of reproduction of parasites by immune factors.**—*Bact. Rev.* **12.** 1–17. 1307

With many parasites the difficulty of demonstrating an inhibition of reproduction lies in deciding on criteria which provide a valid indication of reproductive activity. The study of certain animal parasites on the other hand, has advantages insofar as their reproductive activity can be measured directly. Inhibition of reproduction has been demonstrated in this way in three parasitic infections, namely in *Nippostrongylus muris* infection of rodents, in malaria, and in infection of rodents with non-pathogenic trypanosomes. The inhibitory mechanism involved in these three types of infections is discussed. In *Nippostrongylus* infections the immune reaction affects both migrating larvae and adult worms, the reproduction of the adult females being definitely decreased. The mechanism involves the union of antibodies present in the host's tissues with certain constituents of the worms' bodies or more likely with the materials which exude from them. The precipitate which forms as a result of this union is evidently deleterious in some way to the worm and causes a general lowering of the metabolic processes and along with it, an inhibition of reproduction. In this case the action cannot be called specific inhibition of reproduction.

In malaria it is possible to measure the rate of reproduction accurately by taking into account the average number of merozoites produced by each segmenter together with the length of the asexual cycle. In this way it has been possible to demonstrate that during an infection of malaria in monkeys, the reproductive activity is maintained at a constant rate throughout the initial phase during which the parasitaemia increases in steps after each schizogony. Eventually a crisis is reached when an abrupt decrease in parasitaemia occurs and this is followed by a "developed infection" with a low-level parasitaemia. As long as at least one merozoite per schizont survives, a

static population occurs; when the survival rate increases or decreases, corresponding changes will occur in the parasitaemia level. Destruction of merozoites occurs both intra and extracorpously, the first occurring during the 3-day intracorporeal period and the second just after segmentation. Dead parasites are taken up by macrophages in the spleen, liver and bone marrow. It is explained that although a sharp difference may occur in the parasitaemia level, marked inhibition of reproduction occurs only at the crisis and furthermore is only temporary, after the crisis the original rate of reproduction being resumed. T. believes that this inhibition is associated with the phenomenon of acquired immunity and that the resumption of reproductive activity may be caused by a fall in antibody titre during the developed infection. Such supposedly antigen-antibody reactions as *in vivo* agglutination might result in a suppression of metabolic and hence of reproductive activity of the parasites. Other malarial infections are also discussed in this connexion.

In trypanosome infections of rodents with

*T. lewisi*, an antibody—ablastin—has been demonstrated which is specifically inhibitory to reproduction. It occurs in conjunction with a trypanocidal lysin. By the tenth day of infection all mitotic division and growth of the trypanosomes is inhibited by ablastin and eventually the trypanosomes may be eliminated by the lytic antibody. The former antibody differs from the latter in that it is not absorbed from immune serum by trypanosomes. Recent work has brought the significance of ablastin into question by suggesting that the inhibition of reproduction is the result of a particular susceptibility of dividing trypanosomes to trypanolysin. T. gives reasons why he does not accept this view and discusses recent work on the mechanism of ablastic action.

Ablastic activity has been proved only in certain trypanosome infections, although it is possible that it may play a role in certain bacterial and tapeworm infections.

In summary, T. stresses the biological interest of ablastic activity and points out its possible influence on both normal and neoplastic cell division.—J. F. A. SPRENT.

See also *absts.* 1195-1196 (tuberculin); 1197 (BCG vaccination); 1198 (tuberculin reaction); 1222-1225 (brucellosis); 1247-1250 (F. & M. disease); 1252 (rabies); 1268 (swine fever); 1271 (Teschen disease); 1279-1280 (feline enteritis); 1281 (feline pneumonitis); 1286 (fowl plague); 1348 (antibody response); 1407 (drug allergy); 1520 (book, BCG vaccination).

## PARASITES IN RELATION TO DISEASE [ARTHROPODS]

RIPPER, W. E., GREENSLADE, R. M., & LICKERISH, L. A. (1949.) Combined chemical and biological control of insects by means of a systemic insecticide.—*Nature, Lond.* 163. 787-789. 1308

The authors found that *bis* (*bis* dimethylaminophosphonous) anhydride has very marked systemic, *i.e.*, it is carried in the sap stream to parts of plants not reached by spraying, and selective insecticidal properties; although toxic to pests it does not kill the natural predators and parasites of such plant pests and is especially effective against aphides.

In extensive trials on mice, rabbits, g. pigs and rats toxicity tests, by oral administration, indicated that the chemical was more toxic to laboratory animals when mixed with dry foods, than when plants containing the substance were ingested. No adverse effects were noted in animals fed with crops sprayed 10-60 days previously.—M. L. CLARKE.

I. HALLER, H. L. (1949.) Chemical aspects of some of the newer insecticides.—*Bull. N.Y. Acad. Med.* 25. 874-881. 1309

II. LEHMAN, A. J. (1949.) The major toxic actions of insecticides.—*Ibid.* 882-887. 1310

III. KNIPLING, E. F. (1949.) Recent advances in medical and veterinary entomology.—*Ibid.* 888-896. 1311

I, II & III. A detailed discussion is given of some of the newer insecticides, including the chemical aspects, the toxicity and the recent advances in medical and veterinary entomology. In the last connexion, the following substances are mentioned:—D.D.T. and two analogues, methoxychlor and T.D.E., benzene hexachloride, chlordane, toxaphene (chlorinated camphene) and piperonyl butoxide. There is much useful information in the discussion.—E. M. J.

BARLOW, F., & HADAWAY, A. B. (1947.) Preliminary notes on the loss of DDT and Gam-mexane by absorption.—*Bull. ent. Res.* 38. 335-346. [Authors' conclusions copied *verbatim*.] 1312

There would appear to be little doubt that considerable absorption occurs when oil solutions and emulsions are applied to vegetation and to the mud and plaster of dwellings, with a consequent loss of available insecticide. There is less loss of dispersible powders applied to such surfaces.

It is suggested that attention be directed to the production, for experimental purposes in the first instance, of dispersible powders of various particle sizes and with higher insecticide content, and perhaps of emulsions with varying viscosities and stickiness.

BUSVINE, J. R., & BARNES, S. (1947.) Observa-



tions on mortality among insects exposed to dry insecticidal films.—*Bull. ent. Res.* 38. 81–90. [Authors' summary copied *verbatim*.] 1313

A variety of insects were exposed to films of insecticides by confining them for various periods on filter papers impregnated by a volatile solvent method. The following results were observed:—Nine species of insect and two species of tick were exposed to films of different insecticides for a standard exposure of two hours at 30°C. It was found that freshly prepared films of Gammexane were most toxic, followed by pyrethrins, DDT and rotenone. The relative toxicity of the films of undiluted insecticides is considerably different from that of the same insecticides applied in oily solution. The very sparse toxic films of Gammexane soon lost their toxicity, apparently by evaporation. The pyrethrin films were also less persistent than those of DDT. The test organisms can be arranged in groups showing different types of susceptibility. Percentage mortality among bugs kept in motion for a specified period over a given deposit of DDT is greater than that among stationery bugs exposed to the same deposit for the same period. The addition of an irritant to a DDT spray would therefore enhance the efficiency of the insecticide. A marked time lag in achieving complete mortality among bugs exposed to dry DDT films is recorded. No such lag was observed among bugs exposed to Gammexane nor among lice and flour beetles exposed to DDT. In these latter cases, percentage mortality gradually increased as the time of the exposure increased. Percentage mortality among bugs exposed intermittently to DDT for a given total period of exposure did not differ appreciably from that obtained among bugs exposed continuously for the same period. After intermittent exposure for a particular total time, the length of the intervals during which the insects were in contact with the insecticide did not influence the percentage mortality.

MACLEOD, J. (1947.) The climatology of blowfly myiasis. I. Weather and oviposition.—*Bull. ent. Res.* 38. 285–303. [Author's summary copied *verbatim*.] 1314

The relationship of oviposition to weather, with a standard stimulus (4 per cent. ammonium carbonate), has been tested by a series of 134 exposures of a group of three sheep for one hour. 190 egg clusters were obtained, of which 169 were identified. With the exception of one cluster of *L. caesar* all were *L. sericata*.

There was a fairly close correlation (0.586) of oviposition with air-temperature. When the possible effect of other factors was eliminated, the correlation was little affected, showing that temperature was in itself responsible for the variations

in oviposition. The lower critical limit of temperature was in the neighbourhood of 56°–58°F.

Solar radiation and oviposition had an apparent correlation, but this was found to be spurious, the effect being due to related air-moisture changes. At temperatures near the lower critical limit, insolation did not increase the oviposition rate, or lower its temperature threshold.

Humidity had an apparent inverse correlation with oviposition, but this also was an indirect effect, due to related temperature changes. Humidity showed a closer correlation when expressed as saturation deficiency than as relative humidity. Evaporation rate from a white atmometer sphere had only a low correlation with oviposition.

It is shown that the partial correlations of both saturation deficit and insolation with temperature effects eliminated, are insignificant, *i.e.*, their apparent effects are due to related temperature changes. The multiple correlation coefficient for temperature humidity and insolation is practically identical with that for temperature.

Independent variations of insolation, *i.e.*, variations not simultaneous with related temperature changes, had a significant effect on oviposition; for a given temperature, a high intensity of insolation was less favourable than a low, and this appeared to be a true insolation effect, and not due to associated humidity changes.

Independent variations of humidity had a suggestive but statistically insignificant effect, humidity tending to be inversely related to oviposition.

The regression of log oviposition on temperature, within the limits of this experiment, *i.e.* at temperatures up to 72°F., was linear. The slope was not significantly affected by the insolation and humidity factors, the total coefficient being 0.0419, and the partial coefficient 0.0428. These coefficients are the increase of the log number of egg clusters (plus one) for 1 degree F. increase, *i.e.* the oviposition rate increased in geometric progression for unit increase of temperature, the value  $(N + 1)$  for egg clusters doubling itself for 7° increase.

LINDQUIST, A. W., KNIPLING, E. F., JONES, H. A., & LAAKE, E. W. (1948.) Blow fly control with DDT sprays dispersed from aircraft.—*J. econ. Ent.* 41. 971–973. [Authors' summary copied *verbatim*.] 1315

DDT was sprayed from an aircraft at the rate of 2 pounds per acre as an emulsion, a suspension, and an oil solution, on three adjoining 250-acre plots within a large range area sparsely covered with low, small-leaved brush and trees. DDT deposits collected on glass plates ranged from 55 to 100 per cent of the total dosage released from

the plane. Analysis of leaf samples indicated a marked reduction of DDT 2 weeks after spraying mesquite [*Holcus lanatus*—Ed. V. B.] leaves and live-oak leaves in two plots.

The best control of blow flies (60 to 76 per cent) was obtained in the center of the entire 750-acre sprayed area. The effectiveness of the treatments, as evaluated by liver-baited fly traps in each 250-acre plot, varied considerably. The range during the first 3 days after treatment was from 6 to 68 per cent. It is concluded that to obtain maximum control of blow flies extensive areas must be sprayed with DDT. Treatment of small plots with relatively high single dosages of DDT will not give satisfactory control of flies.

VANDERPLANK, J. F. (1948.) Experiments in cross-breeding tsetse-flies (*Glossina* species).—*Ann. trop. Med. Parasit.* 42. 131-151. 1316

Data on the mating of tsetse flies, mating between members of 12 different species (inter specific) and also between members of different groups are recorded in tabular form. Pupae were collected from East and West Africa. Factors influencing interspecific and inter-group crossing are failures in mating, coitus, insemination, sperm fertilizing ability, development of larval and pupal stages, and also damage during coitus. These factors together with sterility and partial sterility of hybrids are further discussed. Occurrence of hybrids in the field is recorded. *G. palpalis* male hybrids were fertile, but could not mate naturally. *G. morsitans* male hybrids were sterile, but were capable of mating. Female *G. palpalis* hybrids were fertile, whereas some *G. morsitans* female hybrids were sterile, the percentage of sterility depending upon the cross.

With few minor exceptions the existing classification of the status of sub-species in the genus *Glossina* is justified by laboratory experimental work. The author discusses species migration and the possible evolution of new species.—FERGUS S. McCULLOUGH.

SYMES, C. B., HADAWAY, A. B., BARLOW, F., & GALLEY, W. (1948.) Field experiments with DDT and benzene hexachloride against tsetse (*Glossina palpalis*).—*Bull. ent. Res.* 38. 591-612. [Authors' conclusions copied verbatim.] 1317

Single applications of these insecticidal solutions to a very small proportion of total infested vegetation by hand spraying have resulted in a reduction of 50-80 percent of *G. palpalis* for 1-2 weeks only. Repeated applications of insecticide to maintain a toxic deposit over a period of 50-60 days have given a greater and more permanent reduction. It seems, however, that this laborious method of application, even with

excessive dosages, is not likely to eliminate *palpalis*.

It should be emphasised that a very thorough study of the fly was not made in any of these experiments, and that only a relatively small proportion of the vegetation was treated. It is obvious that insecticide was not applied to all the vital places, such as female resting haunts.

In a very small fly belt it would be possible after prolonged and detailed study to treat in this manner the large majority of fly resting places and patrol routes and so most probably to eliminate fly. But to do this in extensive fly belts would be a tremendous task.

It seems that effort must be devoted to the production and trial of formulation that will not be absorbed by vegetation, that will not lose toxicity during prolonged exposure, and at the same time devise some method of application that will give a much greater coverage of vegetation than can be achieved with small knapsack sprayers.

GLASGOW, J. P., & DUFFY, B. J. (1947.) The extermination of *Glossina palpalis fuscipes*, Newstead, by hand catching.—*Bull. ent. Res.* 38. 465-477. [Authors' summary copied verbatim.] 1318

Two blocks were isolated by 3- or 4-mile clearings on a small river with a narrow strip of riverine bush and a low density of *Glossina palpalis fuscipes*.

Catchers at the rate of 6 per 1,000 yards of stream caught almost all the *G. palpalis* in one block in 3 months and all in six months. Eight months later there was no reinfestation. All this time *G. palpalis* persisted in the Control Block.

An area from which *G. palpalis* was removed by hand catching 10 years ago was examined. It is concluded that it is possible not only to hand catch all the *G. palpalis* but also to avoid reinfestation.

Hand catching is the quickest and cheapest known method of reclaiming streams of this type from *G. palpalis*. Vegetational descriptions are given.

VANDERPLANK, F. L. (1947.) Some observations on the hunger-cycle of the tsetse-flies *Glossina swynnertoni* and *G. pallidipes* (Diptera) in the field.—*Bull. ent. Res.* 38. 431-438. [Author's summary copied verbatim.] 1319

The mean hunger-cycles of *G. swynnertoni* and *G. pallidipes* have been studied in the field by marking tsetses with cut proboscidae, which have been released and subsequently recaptured.

The length of time that hungry flies are able to survive before dying from starvation varies with the season, probably according to the amounts of reserve fat and atmospheric humidity.



The mean hunger-cycle also varies with the season and correlates significantly with the evaporation rate or other measurements of humidity. The variation of temperature experienced in these experiments was not sufficient to have any appreciable effect on the hunger-cycle.

*G. pallidipes*, a thick-knit haunting fly and larger than *G. swynnertoni*, a thorn bush species, feeds less frequently than the latter under moist conditions, but more frequently under adverse conditions.

Smaller individuals probably feed more frequently than larger individuals.

WATERHOUSE, D. F. (1947.) **Spray tests against adult mosquitoes. 1. Laboratory spray tests with culicine (*Culex fatigans*) adults.**—*Bull. Coun. sci. industr. Res. Aust.* No. 219. pp. 9–27. 1920

WATERHOUSE, D. F., & ATHERTON, D. O. (1947.) **Spray tests against adult mosquitoes. 2. Spray tests with anopheline (*Anopheles punctulatus farauti*) adults.**—*Ibid.* pp. 29–40. 1921

The spray tests described were carried out in 1942–43 to provide a basis for formulations to use in the control of the mosquito vectors of malaria and dengue fever. Pyrethrum was in short supply and it was necessary to devise formulations having minimum quantities of this insecticide.

1. Mortality produced by pyrethrin sprays appeared to depend more on the amount of pyrethrins atomized than on the volume of spray used. Oils of *Zieria smithii*, *Dacrydium franklinii*, and *Backhousia myrtifolia* gave high mortality, but did not lead to an increase in mortality when added to pyrethrin sprays. The addition of eucalyptus oil, sesame oil, eudesmin (a terpene), thanite (secondary terpene alcohol thiocyanyl acetate) and lethane did not increase the toxicity of pyrethrins. Thanite and lethane sprays both produced high mortality. D.H.S. activator (ethylene glycol ether of pinene) increased knock-down but not mortality, when added to pyrethrins. Low concentrations of N-isobutyl undecylenamide added to pyrethrins did not increase mortality and higher concentrations depressed knockdown and mortality. A 1% D.D.T. spray gave poor knockdown but high mortality. Addition of 0.1% D.D.T. to 0.01% pyrethrins increased mortality.

Methods of carrying out tests are described and results are summarized in tables and concentration-mortality curves. There are comments on the Freon bomb, and on sex and species differences in response to sprays.

2. Tests described in this section were an extension of those carried out under laboratory conditions and were made in the field in New

Guinea. They were conducted with caged females in tents or airy native huts and the insecticides were applied by means of a pressure sprayer or hand spray gun. The lowest concentration of pyrethrins which gave good knock-down and high mortality was 0.07%. A 0.5% D.D.T. spray gave high mortality and its knock-down effect was rendered satisfactory by adding 0.03% pyrethrins or 3.5% thanite. A number of other insecticides and mixtures gave less satisfactory results. In order to obtain reliable information of the efficiency of sprays, particularly those containing D.D.T., it is necessary to make an 18-hour mortality count.—H. McL. GORDON.

ARTHUR, D. R. (1948.) **Some aspects of the ecology of the tick, *Ixodes ricinus*, L., in Wales.**—*Bull. ent. Res.* 39. pp. 321–337. [Author's summary slightly modified.] 1922

The results presented in this paper apply to conditions in Wales. Although admittedly based on limited data, they show that of the nine species of ticks found there, only *Ixodes ricinus*, L. is found on sheep, cattle and horses.

It has been observed that the distribution of ticks throughout Wales is influenced by superficial soil deposits; studies in North, central and South Wales have shown, however, that the vegetation index from which ticks are recovered is variable. Analysis of soils from which ticks are recovered, gave a pH range of from 4.4 to 5.2, and the relationship between "mat" and soil acidity is discussed.

An investigation of four adjoining tracts of vegetationally different land—rush, bracken, heather-winberry and ley—showed that greater populations and a greater rate of activity were apparent in rush land. The significance of topographical location in relation to tick infestation even on land with the same vegetation index is indicated. A salt marsh adjoining an infested non-salt marsh was found to be free of ticks.

The occurrence of a unimodal activity curve is described for central and North Wales. Within a recognized bimodal activity belt irregularities of tick periodicity on cattle have been observed at some farms. This appears to be related to the nature of the sward, and, where good pasture occurs alongside "islands" of damp ground, such discrepancies are noted.

Such "islands" may harbour ticks, while the rest of the pasture is free. When, as the result of certain influences, cattle move to these "islands" they become infested. A meteorological condition is described which leads to such movement indirectly through the agency of the warble fly.

THEILER, G. (1948.) **Zoological survey of the**

**Union of South Africa. Tick survey—Part I.**  
—Onderstepoort *J. vet. Sci.* 23. 217–231. 1323

This report, which is confined to *Amblyomma hebraeum*, is the first part of a general tick survey, initiated in 1937, and based on the collection of ticks by Government Veterinary Officers. Each Veterinary Officer was instructed to divide the area under his supervision into blocks according to altitude, vegetation and rainfall. Ticks were collected from all species of domestic animals in each block, at periods throughout the year, and sent to the Onderstepoort Veterinary Laboratory for identification and record.

The results of this survey indicated that *A. hebraeum* was present in the sub-tropical and temperate forest regions, and in the "parklands", i.e., those regions which are lightly wooded with deciduous trees, evergreens or thorn, and where the bush provided sufficient shelter for the tick. The tick was found to be absent from the desert scrub, the grasslands, and the evergreen sclerophyllous scrub. *A. hebraeum* was able to survive altitudes of 4–5,000 feet. There is evidence that where efficient dipping is practised at regular intervals of 7–14 days a good degree of control can be established.

The report includes four excellent maps of the Union of South Africa illustrating the distribution of the tick in relation to rainfall, vegetation and temperature.—D. W. JOLLY.

BÜCK, G. (1948.) Tiques des animaux domestiques à Madagascar. [Ticks of domestic animals in Madagascar.]—*Ann. Rep. Arch. Inst. Pasteur, Tananarive.* 60–63. 1324

Of 12 species of ticks which are found in Madagascar, the following six are found on domestic animals: *Argas persicus*, *A. moubata*, *A. megnini*, *Uroboophilus fallax*, *Amblyomma variegatum*, and *Rhipicephalus sanguineus*. The author discusses the importance of each species, and includes a table of relevant data.—M. L. C.

VOGELSANG, E. G., CALDERÓN, T. R., & VERGANI, F. (1948.) Presencia del Ototcentor nitens (Neumann, 1897) (Ixodidae) en Venezuela. [Dermacentor nitens in Venezuela.]—*Rev. grancolomb. Zootec. Hig. Med. vet.* 2. 508–509. 1325

In a study of the geographical distribution and species of Ixodidae the authors found that *Dermacentor nitens* was present on horses in six of the 23 States of Venezuela. This species comprised 28% of specimens of ticks examined from almost the entire country.

A distribution map is included.—F. E. W.

GALAIN, M. L. (1945.) Lucha contra la garrapata. [Tick control.]—*Bol. mens. Direcc. Ganad., Montevideo.* 28. 323–328. 1326

G. gives an account of the tick control pro-

gramme in Uruguay. The country was divided into zones, details of the staffing being given. Sodium arsenite dips were used.—F. A. ESTEVES.

WHITNALL, A. B. M., & BRADFORD, B. (1947.) An arsenic-resistant tick and its control with Gammexane dips.—*Bull. ent. Res.* 38. 353–372. [Authors' summary slightly amended.] 1327

During the past 80 years, at least seven species of injurious insects are known to have evolved strains that are more difficult to kill with recognised chemical insecticides than are the normal populations of these pests.

In 1939 it was reported from the East London area [South Africa] that farmers were experiencing difficulty in controlling the one host tick, *B. decoloratus*, by regular dipping in the recognised 7-day strength arsenical wash. Field observations confirmed this.

A technique for treating ticks in the laboratory is discussed in detail. This technique has been put to exhaustive test and some 15,000 adult female *B. decoloratus* have been subjected to *in vitro* treatments with remarkably consistent results.

Experiments are discussed that suggest that arsenic kills ticks by contact. It is further claimed that by using the technique described it has been possible to furnish proof that an arsenic-resistant strain of *B. decoloratus* does exist in South Africa. It would seem that when once the arsenic-resistant tick has established itself on any farm, the continued dipping of cattle in arsenical washes results in an unintentional artificial selection of those varieties within the tick population that are resistant to arsenic. Continued dippings in arsenic thus aggravate the position and some insecticide other than arsenic should be used to combat this arsenic-resistant strain of *B. decoloratus*.

Gammexane was experimented with and it is shown that 0.005 per cent. is sufficient to kill adult females of the arsenic-resistant tick and could be taken as a basis for further experiments. Oil base preparations and water suspensions of Gammexane are twenty times more toxic to the tick than are dust preparations.

WILSON, S. G. (1948.) A method of assessing the acaricidal properties of DDT and "Gammexane" preparations in field trials.—*Bull. ent. Res.* 39. pp. 269–276. [Author's summary copied verbatim.] 1328

DDT and "Gammexane" have many advantages over arsenic as acaricidal agents.

The sites of attachment of the common tick species on bovines are recorded and the killing properties of various dilutions of DDT and



"Gammexane" are assessed by observations on *R. appendiculatus* attached on the ears and *A. variegatum* attached on the udder and flanks of cattle.

The preparations were usually applied as sprays by means of a flit-gun, an Aerograph spray gun, and Kent sprayer or "Solo" hand pump. A "swirling-jet" nozzle was found most suitable. A possible combined spraying-dipping method using a shallow bath is also described.

In preliminary experiments, a spray contain-

ing 2.5 per cent. DDT and a preparation containing 1:10 of the "Gammexane" dispersible powder P.530 killed all ticks attached at time of spraying but the residual effects were lost about the 4th day after spraying. Field experiments gave similar results, but 1:20 of the P.530 powder (0.325 per cent. active gamma) proved equal in killing value to the 1:10 preparation.

The addition of coumarone resin did not increase the residual effects of a 2.5 per cent. DDT emulsified solution.

See also *absts.* 1256 (encephalomyelitis virus from mites); 1515-1516 (Denmark, Reports); 1535 (book, animal ecology).

## PARASITES IN RELATION TO DISEASE [HELMINTHS]

GUILHON, J., & RIOUX, J. (1948.) Essais de traitement de la dicrocoeliose ovine par les dérivés du triphénylméthane. [Treatment of *Dicrocoelium lanceolatum* infection of sheep with crystal violet, basic fuchsine and malachite green.]—*Bull. Acad. vét. Fr.* 21. 303-307. 1329

The dyes were given to ten sheep affected with *D. lanceolatum* infestation, in gelatin capsules each containing approx. 1 g. Four sheep were given doses of crystal violet varying from 0.2-0.37 g. per kg. The 0.2 g. dose increased the number of eggs in the faeces and on P.M. examination the flukes recovered from the bile ducts were all living; 0.37 g. per kg. killed 20% of the flukes but this is very near the toxic dose. Three of the four sheep died 24-48 hours after dosing, either from inhalation pneumonia or the toxicity of the drug. Crystal violet was lethal to this parasite *in vitro*. When introduced accidentally into the respiratory tract, crystal violet was very irritant and caused rapid death from pulmonary oedema. Large doses (0.37g. per kg.) caused abnormal swelling of the portal vessels and the drug was recoverable from this situation.

Basic fuchsine was well tolerated. In small doses malachite green was non-toxic but 0.2-0.3g. per kg. caused fever, dyspnoea and collapse.

—JAS. G. O'SULLIVAN.

REFUERZO, P. G. (1947.) The treatment of fascioliasis in dairy cattle and in Indian buffaloes with hexachlorethane and kamala extract.—*Philipp. J. Sci.* 77. 25-37. 1330

Fascioliasis, caused by either *Fasciola hepatica*, *F. gigantica* or both is an important disease of cattle and buffaloes in the Philippines. Hexachlorethane in bentonite suspension as a one-day treatment is stated to have given unsatisfactory results. Accordingly hexachlorethane and kamala extract were given to cattle at the rate of 10 g. and 1.75 g. respectively, for every 30 kg. body weight. The total dose was divided into approximately equal quantities and was administered

orally and equally distributed over two successive days following an overnight fasting. Feed was withheld for at least three more hours after each dose and single injections of 20% calcium-borogluconate were given to the animals which were in poor condition. Encouraging results were obtained using a differential egg-count test as a criterion of the anthelmintic effect of the mixture and this was confirmed by P.M. examinations. The anthelmintic effect seemed, however, to depend on the intensity of infection in the individual animals, young flukes were unaffected and the drug was not well tolerated if given as a single dose or as a single dose on two consecutive days.

[The evidence against the use of hexachlorethane in bentonite suspension is not given and the observations did not include a comparison of the use of hexachlorethane with and without kamala.]—S. BRIAN KENDALL.

DURIE, P. H. (1949.) A preliminary note on the life cycle of *Paramphistomum cotylophorum* (Fischöeder, 1901) and *P. cervi* (Sehrank, 1790) (Trematoda: Paramphistomatidae).—*Aust. vet. J.* 25. 209. 1331

D. describes the finding of amphistome cercariae in planorbid type snails, incidence of which may be as high as 40% in natural infestations. Cercariae identical with *Paramphistomum cotylophorum* and *P. cervi* were found in *Segnitilia alpheni* and *Glyptaniscus gilberti* respectively. When cercariae from these snails were fed to parasite-free lambs, fluke ova were later recovered from the faeces and mature paramphistomes collected from the rumen. No traces of amphistome cercariae were found in snails of the families Bulinidae or Lymnaeidae collected from marshes grazed by infected cattle.—B. A. FORSYTH.

ALLEN, R. W., & JONGELING, C. H. (1948.) The efficacy of lead arsenate in removing *Moniezia* from lambs.—*N. Amer. Vet.* 29. 645-648. 1332

Lambs infected with *Moniezia* were given 1 g. of lead arsenate in gelatin capsules and the volume

of tapeworm material voided was measured. After 5-7 days the lambs were killed, the intestines were examined for *Moniezia*, and the tissues were also analysed for the presence of lead and arsenic. In tests involving 23 treated animals and six controls, lead arsenate was found to be highly effective. No significant loss in weight or ill effects were observed except in one lamb which died, seven days after treatment. Tissue analyses of seven treated lambs are reported. The amount of arsenic stored in the tissues may vary considerably in different animals; the toxicity of 1 g. doses of lead-arsenate in lambs is discussed in relation to these and previous tests and the conclusion was reached that further work is necessary to establish whether such a dose is non-toxic.

—J. F. A. SPRENT.

TODD, A. C., & HANSEN, M. F. (1949.) **DDT and infective tapeworm larvae.**—*Poult. Sci.* 28. 626-627. 1333

*Raillietina cesticillus* can develop in chicks after exposure of the intermediate host, *Tribolium confusum*, to a D.D.T.-sprayed surface for seven hours. The viability of the cysticeroids may have been reduced by the D.D.T. or by the death of the beetles, which were inactivated in from 3-90 min. after exposure.—M. L. CLARKE.

VON BONSDORFF, B. (1948.) **Folic acid in the treatment of pernicious tapeworm anemia.**—*Acta med. scand. Suppl. no. 213.* pp. 82-90. [In English. Abst. from author's summary.] 1334

Folic acid (pteroylglutamic acid) administered *per os* in doses of 20-30 mg. daily for 7-10 days produced a good remission in human cases of pernicious anaemia caused by infestation with *Diphyllobothrium latum*. Folic acid like the anti-anaemic liver factor is not destroyed by the presence of the tapeworm in the intestinal canal.

RUSSELL, A. F. (1948.) **The development of helminthiasis in thoroughbred foals.**—*J. comp. Path.* 58. 107-127. 1335

The faeces of 26 thoroughbred foals and their dams from seven different studs were examined quantitatively for the eggs and infective larvae of parasitic nematodes. Weekly examinations were made on each foal from the age of 4 to 24 weeks or more. The eggs of the different strongyle nematodes were differentiated by means of the larvae hatched from them and a key for this purpose is given. From the quantitative data obtained it was found that the various species differ in the time of onset of egg laying with respect to the age of the foal. Evidence for the presence of *Strongyloides westeri* appeared first, followed several weeks later by *Trichostrongylus axei*, *Parascaris equorum* and the small cylico-

stomes; eggs from worms of the genera *Gyaloccephalus*, *Poteriostomum* and *Triodontophorus* and of *Strongylus vulgaris* occurred somewhat later and those of *Strongylus edentatus* were the last to appear. The relative preponderance of the eggs of the different species is discussed in relation to the age of the foal, weaning, the concurrent infestation of the dam, stud management and the influence of anthelmintic treatment.—J. F. A. S.

LEVINE, N. D. (1949.) **The effect of various compounds upon horse strongyle larvae in faeces.**—*Amer. J. vet. Res.* 10. 233-239. 1336

L. tested the action of 70 compounds on the development of horse strongyle larvae in faeces, mixing them with the faeces, leaving the mixture for two weeks, and recovering any living larvae then present using the Baernmann technique. The most effective compounds were mercuric chloride, sodium arsenite, nicotine sulphate, potassium iodide, sodium iodide, and iodoform, 0.1% of which, when mixed with faeces, killed all larvae.

—G. M. URQUHART.

ENZIE, F. D. (1949.) **The ascaricidal action of reduced dosages of sodium fluoride in swine and the influence of various concentrations of the chemical on feed consumption.**—*Proc. helminth. Soc. Wash.* 16. 11-16. 1337

The treatment of 61 pigs with feed mixture containing 0.75% sodium fluoride, *ad libitum* for one day, removed 97% of 192 ascarids, 76% of 166 stomach worms, 20% of 1,249 nodular worms and 3% of 233 whipworms. This compares favourably with the published record for 1% sodium fluoride. The effect of unpalatability in limiting overdosage is similar for the two concentrations. Concentrations of 0.5% were comparatively ineffective in trials with 34 animals.

—NESTA DEAN.

JACKSON, R. F. (1949.) **The treatment of heart-worm-infected dogs with arsenamide, a phenyl arsenoxide.**—*J. Amer. vet. med. Ass.* 115. 17-22. 1338

The failure of fuadin (a complex salt of antimony and catechol-sodium-sulphonate) to destroy the adult *Dirofilaria immitis* in dogs led to a series of clinical observations on the therapeutic use of arsenamide, *p*-[bis-(carboxymethylmercapto)-arsino] benzamide, a 1% solution of the drug being administered intravenously at a daily dosage rate of 2.25 mg. arsenamide (0.45 mg. arsenic) per kg. body weight for 15 days. The treatment of 50 cases encountered in routine veterinary practice is described. Microfilaria counts were carried out on each case prior to treatment.

In general the drug was well tolerated, but transitory cough developed in 11 cases and tem-



porary stiffness of the legs in two. There was clinical improvement in cases with slight or typical symptoms of heartworm disease, but in the more serious cases the results were unsatis-

See also *absts.* 1307 (immune factors); 1390 (copper); 1460 (sewage sludge).

## SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUKAEMIAS [INCLUDING FOWL PARALYSIS]

DILLER, I. C., BECK, L. V., & BLAUCH, B. (1948.) **Effect of adrenal cortical extract on the growth of certain mouse tumors.**—*Cancer Res.* 8. 581-589. [Authors' summary slightly modified.] 1339

Mouse sarcoma 87, implanted subcutaneously into a particular strain of mice, showed some spontaneous regression and sloughing. Intraperitoneal injection of adrenal cortical extract greatly increased this reaction in female but not in male mice.

Repeated intraperitoneal injections of this same extract had no demonstrable effect on the growth of definitely established methylcholanthrene-induced sarcomas.

The methylcholanthrene-induced sarcomas did show histological abnormalities in mice receiving large repeated injections of beef adrenal extract.

RILEY, J. F., & DRENNAN, J. M. (1949.) **The presence and significance of alkaline phosphatase in the cytoplasm of mast cells.**—*J. Path. Bact.* 61. 245-251. [Authors' summary copied *verbatim.*] 1340

Mast cells in tissue sections from man, mouse, rat, cat, dog, horse, rabbit, guinea-pig, mole, fowl, frog, axolotl and brown trout were examined

See also *absts.* 1405 (radio-active silver); 1522 (book, neoplasms of the dog.)

factory. J. recommends the use of fuadin subsequent to treatment with arsenamide, to destroy the microfilaria. Further evidence is necessary before any conclusions can be drawn.—K. B. S.

for the presence of alkaline phosphatase by means of the Gomori technique. Only in the mouse and rat was satisfactory evidence obtained for the presence of alkaline phosphatase in mast cells, and even in these two species only a proportion of mast cells contained granules in their cytoplasm which stained positively for the enzyme. These cells were found chiefly near capillaries. With minor exceptions, for which the evidence was equivocal, "free chromotrope substance" (F.C.S.), which is believed to be derived from the granules of mast cells, failed to stain for alkaline phosphatase.

The above data do not support the view which the investigation was designed to test, that the mast cells are concerned in the regulation of reparative growth by the liberation into the tissues of factors for the promotion of growth (F.C.S.) and tissue differentiation (alkaline phosphatase). If the view is correct that histogenous mast cells arise from precursors in the neighbourhood of capillaries, the phosphatase-containing mast cells found in this situation in the mouse and rat may be immature cells and the enzyme contained in their granules may be concerned with the actual formation of the metachromatic material by which mast cells are generally recognised.

## NUTRITIONAL AND METABOLIC DISORDERS

GREEN, H. H. (1949.) **Nutrition and disease in veterinary research.**—*Brit. J. Nutrit.* 2. 354-362. 1341

G. deals with some of the less obvious relationships between diet and disease. A low plane of nutrition may become a predisposing factor to infection. Although the final cause of death in "lamsiekte" of cattle in South Africa is *Clostridium botulinum* Type D, only animals with aphosphorosis are likely to be affected as the infection is transmitted through skeletal debris which is not eaten by healthy animals. Another bacterial disease possibly influenced by malnutrition is necrotic enteritis of young pigs caused by *Salmonella cholerae-suis*. Low nutritional status may also upset the balance between parasite and host as is well known in helminth infestations. Some diseases such as enterotoxaemia and F. & M.

disease, on the other hand, seem to be more prevalent amongst well nourished animals.

There are still some unknown factors in pasture which affect the health of animals grazing on it. One of these factors inhibits the activity of smooth muscle and may have some bearing on the occurrence of bloat in cattle. An "oestrogen-potentiating principle" occurs in some subterranean clovers grown in Australia. If sheep ingest a large amount of this principle, various disturbances in the breeding cycle are noted; some of which can be reproduced experimentally by the administration of stilboestrol. Food grown on areas where swayback of lambs occurs seems to have some connexion with this disease, as animals kept on a copper-deficient diet develop swayback only if they are also given food brought from a swayback area.—E. EDEN.

DUNCAN, C. W., DUNN, K. M., ELY, R. E., DEXTER, S. T., & MILLAR, C. E. (1949.) **Preliminary report on the influence of soil fertility on the health, reproduction and milk production of dairy cows.**—*J. Dairy Sci.* 32. 716. [Only abst. given. Abst. from abst.] 1342

A long-range experiment was started in 1945 on a 200-acre farm to study the characteristics of various species of plants when grown on natural soil highly depleted of mineral nutrients, and on the same soil with large additions of lime and mineral fertilizers. Grass hays and maize, wheat, oats and soya beans were grown on both types of land and the chemical composition determined each crop year. The crop yields on the fertilized soil were far greater than those on the depleted, but the chemical composition of the oats, maize and soya beans showed a remarkable uniformity.

The products from each soil type were fed to a group of dairy cattle, and the milk and fat production records of the cows receiving the unfertilized hay were the higher in the first year, but this difference diminished in subsequent years. No difference was noted in the general well being of the cows on the two rations, but a slightly higher number of services per conception for the cows receiving the food from the fertilized soil was reported. Chemical analyses of the colostrum, milk and blood of all the cows indicated no significant differences.—J. O. L. KING.

TURK, K. L. (1949.) **What's new in dairy cattle nutrition?**—*Vet. Ext. Quart. Univ. Pa.* 49. 30-38. 1343

Colostrum feeding to calves should be extended if surplus colostrum is available. Feeding of vitamin A to the cow increases the liver stores of the calf, but regular vitamin A supplementation of calves has not been proved beneficial. It is doubtful also whether supplementary feeding of the vitamins of the B-complex is essential. No extra vitamin D is required if sun-cured roughage is used. Experiments at Cornell have failed to confirm that supplementary feeding of vitamin E increased the fat content of the milk, and this vitamin does not seem to be essential for reproduction in cattle. The supplementary feeding of cobalt may however be necessary in some areas. Recent experiments have indicated that cobalt deficiency alters the type of bacteria present in the rumen; it also reduces the total number, but its exact function is unknown.—E. EDEN.

REID, J. T., WOOLFOLK, P. G., RICHARDS, C. R., KAUFMANN, R. W., LOOSLI, J. K., TURK, K. L., MILLER, J. I., & BLASER, R. E. (1950.) **A new indicator method for the determination of digestibility and consumption of forages by ruminants.**—*J. Dairy Sci.* 33. 60-71. [Authors' summary copied *verbatim*.] 1344

Mixed forage of the same source cured by barn, oven and field drying and by ensiling, hay consisting largely of Ladino clover, and pasture grass (largely timothy) at three different growth stages were fed to wethers and/or bull calves and/or steers in 36 conventional digestion trials. The dry matter digestibility of these forages ranged from 48.2 to 72.9 per cent.

Spectral examinations of acetone extracts of the forages studied and their corresponding fecal products revealed that some chromogen(s) absorbing light at 406 m $\mu$  was completely recoverable in the feces. The average rate of recovery of the chromogenic substance(s) in the feces of animals fed the forages used in these studies was 100.5 per cent for the 36 trials.

As a result of these studies, a simple, accurate method employing the chromogen(s) absorbing light at 406 m $\mu$  as a reference substance was devised for the estimation of digestibility and consumption of forages by ruminants. This method apparently has a wide range of applicability in nutrition studies with ruminant animals, especially in the study of pastures where a direct measure of consumption is impossible.

PAYNE, W. J. A. (1949.) **Winter feeding and calf mortality.**—*Brit. J. Nutrit.* 3. p. i of absts. [Author's abst. copied *verbatim*.] 1345

In three winter-feeding experiments and three herd surveys, the effect of winter feeding practice on the health and mortality in calves in Scottish herds was ascertained. The experimental work and the surveys show that the inclusion of preserved grass, either dried or as silage, in the winter ration of cows is effective in reducing the calf-mortality rate during the spring months.

In the experiments a comparison was made between cows on a ration containing (1) large amounts of grass silage and/or dried grass or (2) a high proportion of imported concentrates. Ration 1 significantly decreased the incidence of 'nutritional scour' in the offspring and the number of stillbirths and deaths in the 1st month of life as compared with ration 2.

The first survey included 1958 births in forty-two herds during the period 1 October 1947-30 September 1948, the second 3776 births in seven herds during the period 1932-47, and the third 13,285 births in 422 herds during the period 1 October-31 March in the winters of 1945-6 and 1946-7. These surveys confirmed that winter-feeding practices influence the still-birth rate and the mortality rate during the first 3 months of life. It was also found that there is comparatively little variation in calf-feeding methods in west of Scotland herds, and that the first fortnight is the most critical period in the life of the young calf.



MARSHALL, R. A. (1949.) **The digestion of pentosans in hay by sheep.**—*Brit. J. Nutrit.* 3. 1-2. [Author's summary slightly modified.] 1346

In two sheep, the pentosans of meadow hay were digested to the extent of approximately 45%. Most of the digestion of pentosan was accomplished in the rumen and omasum, and an appreciable amount was digested in the small and large intestines. It is doubtful whether any digestion of pentosan occurred in the abomasum.

CARTWRIGHT, G. E., & WINTROBE, M. M. (1949.) **Production of anemia in swine fed purified diets and sulfasuxidine.**—*Proc. Soc. exp. Biol., N.Y.* 71. 54-57. 1347

Twelve pigs, 21-28 days old, maintained on a diet in which purified casein was substituted for crude casein and to which 2% of sulphasuxidine was added, developed a normocytic anaemia similar to the anaemia produced in pigs given a folic acid antagonist. The anaemia could be completely cured by the administration of pteroyl glutamic acid; partial recovery was also obtained by feeding purified liver extracts. The anaemia which developed in animals fed crude casein was less pronounced and disappeared spontaneously.

—E. EDEN.

GEMEROY, D. G., & KOFFLER, A. H. (1949.) **The production of antibodies in protein depleted and repleted rabbits.**—*J. Nutrit.* 39. 299-311. [Authors' summary copied *verbatim*.] 1348

Antibody response in protein depleted and repleted rabbits to beef serum as antigen was quantitatively studied by means of the precipitin reaction.

Turbidity measurements of the precipitins formed over the whole reaction ranged were carried out on the Libby photoreflexometer. The injection technique used for antibody production consisted of a presensitizing dosage of 1 ml. of antigen given intravenously and followed by a regular series of 4 subcutaneous injections of the same amount of antigen on alternate days, three to 4 weeks later.

A new type of semi-purified diet in an agar base was developed that would carry rabbits through the depletion and repletion periods. The diet was supplemented by carrots throughout the experiments. The average caloric intake of the rabbit was determined during the course of the experiments.

Antibody response is higher in repleted than in depleted animals. It is only slightly higher in rabbits fed a commercial diet than in the protein depleted animals. A high protein diet supplemented by other essential dietary factors is valuable for the production of hyperimmune sera in rabbits.

ANON. (1949.) **Amino acids as the sole dietary nitrogen source in dogs.**—*Nutr. Rev.* 7. 268-269. 1349

Adult dogs were fed for 40 days a mixture of amino acids obtained from casein hydrolysate as the sole dietary nitrogen, then they were given the amino acids intravenously for another 24 days. When compared with control animals there was no marked difference in the weight or in the protein content of the blood. Two puppies, 12 weeks old, were also fed amino acids as their sole source of dietary nitrogen. At first this caused vomiting, but once the animals learned to consume the amino acids in small portions, they made similar gains to the control group in which food consumption was limited to that of the experimental group. This growth rate was below that of puppies fed *ad libitum*.—E. EDEN.

BLAXTER, K. L., & WOOD, W. A. (1949.) **The endogenous nitrogen metabolism and basal energy metabolism of the young Ayrshire calf.**—*Brit. J. Nutrit.* 3. pp. ii-iii of absts. [Authors' abst. copied *verbatim*.] 1350

The relation between basal metabolism and endogenous nitrogen metabolism in three young Ayrshire calves was investigated. Semi-synthetic diets made to resemble whole milk in composition were used during all preliminary and post-experimental periods, and the endogenous nitrogen excretion was determined when the calf was subsisting on a diet containing no protein other than that contained in a small quantity of yeast extract. Basal metabolism was determined by respiratory exchange methods 24 hr. after withdrawal of food.

The basal metabolism of the calves was found to be very high, 41.9, 42.0 and 45.5 Cal./kg./day. Their endogenous nitrogen metabolism was 83.8, 80.8 and 81.9 mg./kg./day. Both these are at least double the values found at maturity in cattle. The mean ratio of endogenous nitrogen loss to basal heat loss was  $1.90 \pm 0.068$  mg./Cal. This value is in close agreement with Smut's (1935) value obtained on mature animals of different species of 2.0 mg./basal Cal. and indicates that the metabolism of the very young animal obeys the 'Terroine-Sorg-Matter' law, which states that the ratio of endogenous nitrogen metabolism to basal heat loss is a constant.

The distribution of urinary nitrogen changed markedly when the nitrogen-free diet was given. The daily excretion of creatinine and of uric acid and allantoin remained constant; urea and ammonia excretion fell to 24% of the initial values. Creatine excretion was greatly reduced and in two cases creatine disappeared from the urine altogether. The distribution of urinary nitrogen during the period of low nitrogen feeding indicated that 12% of the total endogenous nitrogen was

present as creatinine nitrogen, 49% as urea and ammonia nitrogen, and over 80% as purine nitrogen.

BACHARACH, A. L., CUTHBERTSON, W. F. J., & THORNTON, D. M. (1949.) **An outbreak of nutritional (iron deficiency) anaemia in weanling stock rats.**—*Brit. J. Nutrit.* 3. 3-12. [Authors' summary copied *verbatim*.] 1351

Nutritional anaemia occurred, markedly in weanlings and less obviously in pregnant does, in an albino rat colony receiving a stock diet previously found satisfactory, when the diet was modified and the iron content unintentionally reduced through the replacement of National (85% extraction) flour by Canadian 'D' (70-72% extraction) flour. Following addition of ferrous sulphate to the diet, and a simultaneous increase in its calcium content, already high, there was no recurrence of the outbreak. Adult males or non-pregnant females showed few, if any, signs of reduction in red blood-cell count when they received the same diet as the slightly anaemic pregnant does and the markedly anaemic weanlings.

No animals, infant or adult, in a colony of piebald rats, kept alongside, under the same conditions and on the same diet as the albinos, showed any adverse effects of identical reduced iron intake and alteration of diet.

NICKSON, M., LAMERTON, L. F., & MAYNEORD, W. V. (1949.) **Absorption of metallic cobalt-60 from a subcutaneous site.** [Correspondence.] —*Nature, Lond.* 164. 618. 1352

Metallic cobalt in the shape of a wire or disc was inserted under the loose skin of rats. Unless coated with gold this caused local inflammation which was noticeable after the fourth day, and very marked on the 14th day. Each operation was carried out first with inactive Co<sup>59</sup> and then repeated with the radio-active form, Co<sup>60</sup>. The counts in the tissues around the inserted wire were about ten times, and in those where discs had been inserted about 95 times, that of the background. Radio-active cobalt was also found in different organs of the body and in the excreta. It should not therefore be used parenterally without further investigations.—E. EDEN.

COMAR, C. L., & DAVIS, G. K. (1947.) **Cobalt metabolism studies. III. Excretion and tissue distribution of radioactive cobalt administered to cattle.**—*Arch. Biochem.* 12. 257-266. [For part II, see *V. B.* 17. 327.] 1353

The role of cobalt in the animal, especially ruminants, is of great economic importance.

A dipping-type counter tube for the estimation of labelled (radio-active) cobalt is much faster than the electroplating method. The best

available preparation of radio-active material used gave a sensitivity of 0.0001 µg.

Jersey steers, adequately fed, were given 218 µg. Co in a capsule. After 15-24 hours it appeared in the faeces and the bulk, 80% of the dose, was eliminated in 24-72 hours after dosage; 0.6% only appeared in the urine.

When the Co was injected into the jugular vein, it appeared after 40 min. in the urine and in 24-72 hours after dosage 60% of the dose was eliminated; 80% went into the faeces.

Store cattle, raised on a diet with less than 0.01 p.p.m. Co., were used. They were emaciated, very weak and rough-coated. They were killed at intervals after dosing and a table of distribution of Co in the tissues is given. Up to 46% of the dose went to the liver and was eliminated in the bile.

Two cows, a Jersey and a Friesian, when 6-9 months pregnant were given small doses orally twice weekly to a total of 171 µg. and 217 µg. respectively of radio-active Co; another pregnant cow was injected intravenously with weekly small amounts to a total of 218 µg. Some cobalt was transmitted across the placenta primarily for storage in the liver of the foetus, but the amount which reaches the foetus is so small that its significance is doubtful.—W. F. SYVRET.

ENDER, F., HALSE, K., & SLAGSVOLD, P. (1948.)

Undersøkelser vedrørende krampe og lammelser hos kyr. Hypomagnesemi hos melkekyr frambrakt under kontrollerte fôringsbetingelser. Et tilfelle av hypomagnesemi med dødelig utgang. [Tetany and paresis in cows. Hypomagnesaemia in dairy cows induced by food control conditions. Fatal case of hypomagnesaemia.] —*Norsk VetTidsskr.* 60. 1-28. 41-80. [English summary.] 1354

The authors studied feeding reports for 11 Norwegian dairy herds in which there had been a high incidence of tetany and paresis during the war years. The fodder constituents were those in general use in Norway at that time, e.g. hay, straw, root crops, silage, and cellulose, with herring meal as the main concentrate. Two of the herds had in addition been fed potato flour waste during the period prior to outbreak of disease. In most of the herds outbreaks of tetany followed a reduction in calories (by cutting down hay and root crops) greater than the reduction which would normally be made with decreasing lactation.

Eight cows were used in feeding trials carried out on principles based on the above reports. For a short preparatory period immediately after calving they were given proteins and calories in excess of requirements. Five of the cows (Nos. 1, 2, 3, 9 and 10) were then given a diet deficient



in calories, the protein value being either maintained or increased. Hay and cellulose were reduced and roots omitted. One cow (No. 5) was given a diet deficient both in calories and in protein. Two others (Nos. 4 and 11) had their diet abruptly changed, the roots and part of the hay being replaced by cellulose, but the calorie and protein values being maintained. Three of the cows (Nos. 5, 9 and 11) were given A.I.V. silage supplements to their fodder. All the cows were given normal amounts of Ca and P, but during the latter part of the tests the rations of all the cows were deficient in magnesium.

After a month of underfeeding which included one period of 36 hours on bare subsistence rations, one cow (No. 3) developed symptoms of tetany. It had had nervous symptoms from the 17th day after the rations had been cut down. After seven weeks on the deficient diet, including two more brief periods on bare subsistence level, this cow died.

In one cow (No. 1) there was increased reflex irritability over a protracted period following under-feeding for more than two months. In three cows (Nos. 5, 9 and 10) nervous symptoms were observed several times during the trials. One cow (No. 4) had four 36-hour periods on bare subsistence rations in one month and at the end of one of these periods increased reflex irritability was observed. In two of the cows (Nos. 2 and 11) no nervous symptoms were observed.

The authors point out that the differences in symptoms did not result solely from the varying degrees of calorie deficiency, for cow No. 2 which had no nervous symptoms was as severely underfed as cow No. 3 which died.

Serum magnesium levels before and after the feeding experiments indicated that hypomagnesaemia was connected with the change of diet. In the cow that died serum Mg fell from 2.35 to 0.85 mg. % during the first five days of underfeeding, and this cow was the only one in which the serum calcium level remained low for any length of time. At the appearance of the first nervous symptoms the serum calcium fell to 8.5 mg. %. On bare subsistence rations the serum calcium again fell to 6.1 mg. % and symptoms of tetany appeared. The highest acetone level in the urine was 200 mg. %.

The authors concluded that cow No. 3 died of a metabolic disorder closely related to grass tetany. They were unable to find conclusive evidence whether it was calorie deficiency or deficiency of specific fodder constituents that had caused the illness. The eight cows used in these trials reacted more slowly to the fodder deficiency than might have been expected from a study of

the feeding in the 11 diseased herds, and it was concluded that these eight cows must have had greater powers of resistance.—F. E. W.

BIRD, F. H. (1949.) **Magnesium deficiency in the chick. I. Clinical and neuropathologic findings.**—*J. Nutrit.* 39. 13-29. 1355

One hundred and ninety-one single-comb, white Leghorn chicks were kept on a ration low in magnesium. Although most of the animals survived, about 93% had symptoms of functional disturbance; growth and feathering were poor; decreased muscle tone, squatting, ataxia, fine palpable tremors and progressive incoordination were also observed. A description is given of the neuropathological alteration of the Purkinje cells in the cerebellum. The supplementation of the diet with 0.3%  $MgSO_4$  prevented the occurrence of all these symptoms.—E. EDEN.

BARON, J. (1945.) Contribution à l'étude des manifestations cliniques dues à la déficience en sels calciques et à l'insuffisance de leur fixation chez le porc. [**Symptoms of calcium deficiency in pigs.**—*Thesis, Alfort.* pp. 54. 1356

The pig industry is of considerable importance in Brittany. In B.'s experience the deficiencies and imbalance of calcium and phosphorus account for the majority of losses, with poor hygiene and feeding as contributory factors. He gives a short account of calcium metabolism and of the aetiology of osteodystrophies, and the clinical manifestations of calcium deficiencies are given in detail. It is stressed that symptoms are most commonly seen in the pregnant sow and in the rapidly growing piglet. Treatment and prophylaxis are indicated.—G. V. LAUGIER.

MEYER, A. E., & GREENBERG, J. (1949.) **Value of calcium hypophosphite and other calcium supplements in calcium-low diets.**—*Proc. Soc. exp. Biol., N.Y.* 71. 40-43. 1357

The use of calcium hypophosphite for calcium therapy was thought worthy of a trial since the salt contains 23% Ca, is adequately soluble and has no objectionable taste. Calcium assimilation tests were, therefore, carried out on young rats, their weights and the femoral ash content being taken as the best guide for establishing the presence or absence of calcium depletion.

It was found that the assimilation of calcium is about the same whether supplied as hypophosphite, gluconate, phosphate or carbonate, but evidence was obtained to suggest that hypophosphite P may be utilized by the animal. It also appears that the Ca : P ratio of the diet may be varied within wide limits without affecting the calcification of bone provided that adequate amounts of both elements are present. It was concluded that calcium hypophosphite is well

sued to serve as a supplement to dietary calcium.

—J. A. NICHOLSON.

LIEGEOIS, F., & DERIVAUX, J. (1949.) Nature de l'hypertrophie parathyroïdienne due à l'hyperphosphorose alimentaire chez le porc. [Parathyroid hypertrophy resulting from hyperphosphorosis in the pig.]—*C. R. Soc. Biol. Paris*. 143. 587-588. 1358

The pig has two parathyroid glands embedded in the thymus under the wing of the atlas. Their histology is described. Experimental hyperphosphataemia results in marked hyperplasia of the secreting elements (eosinophile cells with vacuolated nucleus) of these glands, indicating greater functional activity, which implies increased elimination of phosphorus by the kidneys. In general, hyperplasia of the parathyroids is the result of a wide Ca/P ratio, and tends to narrow the ratio by eliminating more phosphorus.

—F. B. LEECH.

LÜBKE, A. (1949.) Die Bedeutung der Jodprophylaxe für die Bekämpfung der erhöhten Ferkelsterblichkeit. [Iodine treatment of sows for control of mortality among piglets.]—*Tierärztl. Umsch.* 4. 155-158. 1359

One hundred and twenty-four sows received daily supplements of iodine during the whole or part of their pregnancy. The amount administered was approximately 250 µg. of iodine in the form of potassium iodide and iodine mixed with sodium chloride. This reduced the percentage mortality of the piglets. As iodine feeding had no harmful effects L. advocates that at least in the iodine deficient areas of Southern Germany the food for pig rearing should be supplemented daily with this element.—E. EDEN.

ANON. (1949.) Fluorine in foods.—*Lancet*. 257. 664. 1360

The risk of dental caries in early life is reduced if the drinking water contains one part per million (p.p.m.) of fluorine; but many water supplies do not provide this and most foods contain little fluorine (0.2-0.3 p.p.m.); tea (75-100 p.p.m.) and sea foods (5-15 p.p.m.) are exceptions. The fluorine content of plants generally does not depend on the soil fluorine; high values are most likely caused by industrial contamination. It is advocated that up to the age of 16 the diet when low in fluorine should be supplemented.—E. EDEN.

HEBELER, H. F. (1949.) Osteomalacia in pregnant Jersey heifers.—*Vet. Rec.* 61. 386-387. 1361

Two pedigree Jersey heifers two years old and about nine months in calf were found to be lame, with stiff gait and "bowing" of the fore limbs. All the weight was taken on the lateral

edge of the sole of the lateral claw and the distal epiphyses of both radii were enlarged and tender. The lameness set in suddenly. Blood analyses revealed no abnormality, except slightly reduced haemoglobin values. A diagnosis of osteomalacia probably resulting from calcium deficiency was made. Treatment consisted of feeding dredge corn together with 1 oz. cod-liver oil and 1 oz. steamed bone flour daily. The animals calved normally.

The herd was kept on intensive lines and in summer the pregnant heifers followed the dairy cows in grazing a lucerne-cocksfoot ley. Soil analyses indicated no calcium or phosphorus deficiency, but it is suggested that the Ca:P content of the herbage may have been deficient which, together with the early age at which the heifers were required to calve, may have accounted for the osteomalacia.—J. A. NICHOLSON.

GRASHUIS, J., & DE MAN, J. (1947.) De vitaminen in de veevoeding. [Vitamins in cattle feeding.] pp. 64. Hoogland: Instituut voor Moderne Veevoeding "De Schothorst". F. 1.50. 1362

A brief account is given of the nature and functions of vitamins A, B complex, C, D, E, F, K and P and of some less well defined factors with regard to human requirements and to their importance in animal nutrition.—A. M. COPPING.

HARRIS, L. J. (1949.) Antivitamins and other factors influencing vitamin activity.—*Brit. J. Nutrit.* 2. 362-373. 1363

Examples of various dietary and other factors affecting the vitamin potencies of foods are discussed. The antivitamin proper are a class of substances that resemble so closely particular vitamins in structure that they may function by blocking their action. The first of these to be discovered was sulphanilamide which antagonizes *p*-aminobenzoic acid. A list of other antivitamin is given.—E. EDEN.

ALLEMANN, O. (1948.) Ueber den Einfluss verschiedener Grünfuttermittelkonservierungsmethoden auf die fettlöslichen Vitamine. [The influence of various preservation methods of green fodder on the fat-soluble vitamins.]—*Schweiz. Arch. Tierheilk.* 90. 266-271. 1364

In hay sun-dried at an altitude of 500-600 m. carotene is not noticeably damaged, at 2,000 m. it is reduced however to 50% through the action of ultra-violet light. Drying in the shade or on stakes is detrimental owing to autoxidation. Carotene is not affected by fermentation in the haystack or by artificial drying or ensilage. Vitamin E is similarly influenced by these factors, but is more sensitive to ultra-violet light and fermentation. Vitamin D is favourably influenced by light, not affected by drying and fermentation.



but damaged by drying in the shade and by all methods of ensilage.—W. STECK.

ANON. (1949.) **Conversion of vitamin A to carotene.**—*Nutr. Rev.* 7. 135–136. 1365

Additional tests for vitamin A have given further evidence that this compound is formed in the intestinal wall after feeding  $\beta$ -carotene (Mattson, 1948). The inability of the body to convert  $\beta$ -carotene once it has been absorbed is further demonstrated by the experiments of Sexton *et al.* (1946);  $\beta$ -carotene when injected is stored in the liver, but is physiologically unavailable there and rats with large stores die of vitamin A deficiency. The permeability of the intestinal wall towards  $\beta$ -carotene varies in different species; rats are unable to absorb carotene, whereas in cattle large amounts are absorbed and the level in plasma is mainly dependent on the dietary intake.—E. EDEN.

JUNGHER, E. L., HELMBOLDT, C. F., & EATON, H. D. (1949.) **Experimental vitamin A deficiency in young dairy cattle.**—*J. Anim. Sci.* 8. 641. [Only abst. given. Abst. from abst.] 1366

Eight calves, average age 192 days, were kept on a ration low in vitamin A. Two of these animals also received a supplement of the vitamin. In the unsupplemented group, vitamin A in the blood and liver decreased to very low levels; there was an increase in the cerebrospinal fluid pressure, but no change in the haemoglobin levels. The animals were killed when daily convulsions developed. Gross pathological changes were absent. Histological examination indicated that for diagnostic purposes the parotid gland is the most likely organ to reveal specific morphological signs of vitamin A deficiency.—E. EDEN.

BLAKEMORE, F., DAVIES, A. W., EYLENBURG, E., MOORE, T., SELLERS, K. C., & WORDEN, A. N. (1948.) **The relative importance of antibodies and vitamin A in preventing disease in young calves.**—*Biochem. J.* 42. p. xxx of Proceedings. [Only abst. given, copied *verbatim*.] 1367

Exploratory experiments confirmed previous claims that calves developed fatal 'white scour' when they are denied colostrum and kept on a diet of whole or separated milk. Ayrshire and Jersey calves were found to be particularly susceptible to the disease, while Friesians, which are larger in size, were more resistant.

The protective action of colostrum has been ascribed to its antibody content, but since the calf is normally born with low reserves of vitamin A its significance as a rich source of this vitamin has also been considered. Attempts to protect calves from 'white scour' with concentrated preparations of vitamin A, administered in various forms, were

unsuccessful. If the vitamin was given before 'white scour' had started its absorption was indicated by a temporary rise in the level in the plasma, and by the recovery of a portion of the vitamin from the liver *post-mortem*. If dosing was commenced or continued after the development of 'white scour', however, there was no corresponding rise in the level in the plasma, and much vitamin A was excreted in the faeces. On the other hand, calves were kept alive by feeding them on colostrum followed by separated milk. Evidence was obtained that the protective value of colostrum was associated with its globulin content, since calves inoculated with precolostrum, and fed on separated milk, survived the early critical period. Antibodies, in a concentrated form, were demonstrated in precolostrum.

The possibility that deficiency of vitamin A may at a later stage be of practical importance in the rearing of bovines in this country was suggested by the constriction of the optic nerves found in steers fed upon diets consisting largely of sugar-beet pulp. Analysis of the blood and livers of some of the animals afflicted with this disease indicated that they were deficient in vitamin A. Other affected animals had adequate reserves of vitamin A when killed, but their dietary history usually suggested the possibility of deficiency during a critical period of their development.

LINDLEY, C. E., BRUGMAN, H. H., CUNHA, T. J., & WARWICK, E. J. (1949.) **The effect of vitamin A deficiency on semen quality and the effect of testosterone and pregnant mare serum on vitamin A deficient rams.**—*J. Anim. Sci.* 8. 590–602. 1368

Thirty-five ram lambs, age 3–5 months, were fed a vitamin A-deficient diet. Ten animals received in addition supplements of vitamin A, another ten testosterone propionate and a further ten pregnant mare's serum. Animals not receiving vitamin A developed deficiency symptoms after periods of 7–21 weeks. These included muscular and nervous incoordination, partial loss of appetite, general weakness, night blindness, mild convulsions, and general unthriftiness. Plasma levels of vitamins A and C dropped and semen quality was low. A high percentage also had cystic pituitary glands. Neither testosterone propionate nor pregnant mare's serum exerted any beneficial influence on semen quality of vitamin A-deficient rams.—E. EDEN.

EVELETH, D. F., BOLIN, D. W., & GOLDSBY, A. I. (1949.) **Experimental avitaminosis A in sheep.**—*Amer. J. vet. Res.* 10. 250–255. 1369

The serum vitamin A level of ewes kept on a diet deficient in this factor was low, whereas the cerebrospinal fluid pressure was increased

when compared with control animals receiving carotene. Deficient animals also had decreased liver storage of vitamin A; they developed night-blindness and muscular incoordination but growth, wool production and conception were normal. The final cause of death of lambs with vitamin A deficiency was generally some infection.

—E. EDEN.

MADDOCK, C. L., WOLBACH, S. B., & MADDOCK, S. (1949.) **Hypervitaminosis A in the dog.**—*J. Nutrit.* 39. 117-137. 1370

Two puppies (litter mates), two months old, were dosed daily for 58 and 68 days respectively with 300,000 I.U. of vitamin A per kg. body weight. The form of vitamin A given was a concentrate containing 500,000 I.U. per g. Three other puppies from the same litter were kept as controls. Detailed P.M. findings and skeletal changes are given. The serum vitamin A level increased considerably and at the terminal stages of the experiment decreased blood cholesterol and phospholipoid values were noted. No change occurred in the blood sugar, non-protein-nitrogen, uric acid, creatinine, serum sodium or chloride. The bromsulphophthalein test also gave normal results.—E. EDEN.

RODAHL, K. (1949.) **Hypervitaminosis A and scurvy.** [Correspondence.]—*Nature, Lond.* 164. 581. 1371

Rats, mice, g. pigs, rabbits, dogs and fowls were fed excessive amounts of vitamin A. Within a few hours of feeding 50-100 I.U. per g. body weight toxic signs became evident. Continued administration caused signs similar to those observed in human scurvy; lowered levels of ascorbic acid in the serum, adrenal glands and liver were also noted. R. considers however that abnormalities in vitamin C metabolism cannot be the sole causative factor in hypervitaminosis A.

—E. EDEN.

RODAHL, K. (1949.) **Toxicity of polar bear liver.** [Correspondence.]—*Nature, Lond.* 164. 580-581. 1372

Daily ingestion of 0.5-0.7 g. of polar bear liver, containing approximately 10,000 I.U. of vitamin A was toxic for rats. Equivalent amounts from which the vitamin A has been destroyed had no effect. Livers of snow hare and walrus which are considered non-poisonous by the Eskimos contained very small amounts of vitamin A.

—E. EDEN.

GULLICKSON, T. W., PALMER, L. S., BOYD, W. L., NELSON, J. W., OLSON, F. C., CALVERLEY, C. E., & BOYER, P. D. (1949.) **Vitamin E in the nutrition of cattle. I. Effect of feeding vitamin E poor rations on reproduction, health, milk**

**production, and growth.**—*J. Dairy Sci.* 32. 495-508. 1373

Eight bulls and 22 cows were maintained on a ration low in vitamin E, which was incapable of supporting normal reproduction in rats. Spermatogenesis was normal and the average breeding efficiency of the bulls was 83.3%. Oestrous cycle and ovulation occurred regularly and there were no abnormalities during pregnancy or parturition. Thirteen animals died suddenly, however, apparently from cardiac failure.—E. E.

BECKER, E. R., BRODINE, C. E., & MAROUSEK, A. A. (1949.) **Eyelid lesion of chicks in acute dietary deficiency resulting from blood-induced *Plasmodium lophurae* infection. I. Description; role of pantothenic acid and biotin.**—*J. infect. Dis.* 85. 230-238. [Authors' summary copied verbatim.] 1374

An eyelid affliction is described, one characterized in its severest form by a process involving the encrustation and eroding away of the lower eyelid, and a healing process involving the regeneration of a replacement for the lost eyelid. The overgrowth may entirely, almost, or partially cover the eye. The milder form of the disorder produced a prominent notch in the margin of the lower lid. The development of lesion occurred under the following conditions: (1) The chicks were eating a ration ("G-ration") composed of 82% cereal grain products; (2) they were young, i.e., 12 or 14 days of age; (3) following inoculation they developed infections of *Plasmodium lophurae* of a certain intensity. It was not the absolute intensity of the parasitemia that precipitated the lesion but the attainment of a certain density within a certain period of time after inoculation. The evidence indicates that the disorder was the result of an acute dietary deficiency precipitated by competition for biotin and/or pantothenic acid between the host and a vigorous parasite population reproducing at its maximum rate. Supplementing the ration with small amounts of either of these vitamins forestalled the affliction. The suddenness of the onset and severity of the lesion, and the failure of a modification of the G-ration with almost identical biotin and pantothenic acid content (S-ration) to produce the lesion in infected birds, suggest that other factors also are concerned.

POPPER, H., KOCH-WESER, D., & SZANTO, P. B. (1949.) **Protective effect of vitamin B<sub>12</sub> upon hepatic injury produced by carbon tetrachloride.**—*Proc. Soc. exp. Biol. N.Y.* 71. 688-690. 1375

Sixty-nine rats, 2-3 months old, were kept on a high protein diet and were given intraperitoneally 1 ml. of mineral oil containing 0.033 ml. of carbon tetrachloride per 100 g. body weight. Of these animals 38 were given in addition 15 µg.



of vitamin B<sub>12</sub> per 100 g. body weight divided into four doses and injected subcutaneously 72, 48 and 24 hours prior to and simultaneously with the injection of carbon tetrachloride. The administration of vitamin B<sub>12</sub> inhibited the development of fatty metamorphosis of the liver and the depletion of ribonucleic acid. In these livers less bromsulphalein was retained when compared with the intoxicated controls. On the average in the vitamin B<sub>12</sub> treated animals there was approximately one-third of the change observed in non-protected rats. The dose used was considerably larger when compared with the effective dose in anti-anaemic therapy, but smaller on an absolute weight basis when compared with other substances used in lipotropic or protective therapy of the liver.—E. EDEN.

KAISER, R. (1949.) Vitamin "T". [Vitamin T.].—*Wien. tierärztl. Mschr.* 36. 305–312. 1376

Vitamin T is claimed to help the optimal utilization of food. As yet it has not been isolated and in the experiments reported, an extract from *Torula* yeast has been used. It is stated that this new factor is not identical with any of the known vitamins of the B-complex, but no details of the extraction procedure are given. When this extract was fed to calves and pigs the weight gains were greater than in animals not receiving the supplements. As no details are given of the basal diet, it is difficult to assess the significance of these results.—E. EDEN.

PEMBERTON, R., EIMAN, J., PATTERSON, F. M. S., & STACKHOUS, E. A. (1947.) Attempts at the experimental production of arthritis.—*J. Lab. clin. Med.* 32. 1121–1129. [Authors' summary copied *verbatim*.] 1377

Arthritic-like lesions were encountered in groups of rats maintained on standard laboratory rations and on grossly unbalanced diets and in animals receiving injections of massive doses of desoxycorticosterone acetate, together with a one per cent NaCl solution for drinking water, joint changes were formed in 50 per cent of young female white rats. These results are at variance with the findings of certain other workers that arthritic lesions are rarely seen in intact desoxycorticosterone-treated rats. Attempts to increase the incidence and severity of these arthritic-like lesions by exposure to cold, by thyroidectomy, adrenalectomy and gonadectomy were unsuccessful. The changes observed in the joints are those of focal areas of degeneration and ulceration in the articular cartilages.

BODDIE, G. F. (1949.) Metabolic disturbances in ruminants.—*Vet. Rec.* 61. 85–86. 1378

Milk fever and grass tetany are discussed in regard to aetiology and treatment. Cases which

respond to udder inflation but not to calcium therapy are discussed and the possibility of a reflex response to udder inflation is suggested. B. emphasizes the dangers of udder inflation, and indicates the precautions necessary.

Acetonaemia is also discussed with reference to aetiology and treatment. B. found that high levels of ketone can occur in the blood and urine of normal cows; that the blood-acetone level tends to rise throughout the winter in dairy cows but not in beef cows; that ketones can be produced *in vitro* by incubating rumen contents taken from a cow in late winter with a foodstuff such as turnips, and that ketones are produced in the normal rumen, the ketone production increasing with indoor winter feeding. A combination of causal factors is suggested, including excessive lactation, pregnancy, winter feeding and lack of exercise. The occurrence of ketosis in post-parturient haemoglobinaemia is mentioned in a short discussion of its aetiology.

The relationship between malnutrition and infestation with helminth and skin parasites is discussed.

Cobalt deficiency is treated very briefly, and the importance of differential diagnosis is emphasized.—A. G. SINGLETON.

KINNEY, T. D., HEGSTED, D. M., & FINCH, C. A. (1949.) The influence of diet on iron absorption. I. The pathology of iron excess.—*J. exp. Med.* 90. 137–146. 1379

HEGSTED, D. M., FINCH, C. A., & KINNEY, T. D. (1949.) The influence of diet on iron absorption. II. The interrelation of iron and phosphorus.—*Ibid.* 147–156. [Authors' summaries copied *verbatim*.] 1380

I. Rats placed on a corn grit diet and added iron absorbed large amounts of iron in contrast to control groups.

The histological picture was that of progressive hemosiderosis of the hepatic parenchyma and of the reticuloendothelial system. On chemical analysis, the iron content of the liver was found to be greatly increased. This supports the concept that the liver represents the chief storage organ for iron so absorbed.

These data indicate that a normal block for iron absorption may be overcome under certain circumstances.

II. Rats fed a corn grit diet containing large amounts of ferric citrate absorb and deposit excessive amounts of iron in their livers. Undoubtedly various factors are involved in iron absorption, but these studies indicate that the low level of dietary phosphate was primarily responsible.

The addition of phosphate salts to this diet

has shown that the amount of iron deposited in the liver was inversely related to the phosphorus content of the diet.

It is possible to obtain excessive iron deposits in the livers of animals receiving a normal diet, by adding large amounts of iron salts to the diet.

See also absts. 1220 (trace elements and brucellosis); 1392-1393 (agenized flour); 1523 (book, mineral nutrition); 1524 (book, trace elements).

## DISEASES, GENERAL

GORRIE, C. J. R. (1949.) Recent knowledge of some diseases of poultry. [Abstract of address delivered at a general meeting of the Victorian Division of the Australian Veterinary Association.]—*Aust. vet. J.* 25. 185-186. 1381

"Round heart disease" (enzootic fatal syncope) of poultry has occurred in 26 outbreaks in the past five years in Victoria. There is no evidence that it is infectious and environmental conditions combined with individual susceptibility appear to be involved in the aetiology. Both the acute and chronic clinical types of the disease have been seen, and the majority of cases have been in White Leghorn pullets 8-12 months old.

Mention is made of the difficulties sometimes experienced in the diagnosis of fowl pox, and of some of the problems associated with vaccination. Vaccination with egg-grown pigeon pox vaccine, with its low virulence for poultry, is considered ideal for the control of fowl pox in a flock once an outbreak has appeared.

Spirochaetosis is endemic in northern areas of Victoria and because of conditions existing on some properties eradication of the vector is sometimes impracticable. G. prepared a vaccine using the developing embryo for the cultivation of spirochaetes, and this vaccine has proved effective in protecting fowls against experimental infection.

—J. T. HAYSTON.

SEIFERLE, E. (1948.) Ueber Gehirnkrankheiten des Pferdes und einen Versuch zu ihrer neurologisch-psychologischen Auswertung. [Cerebral diseases of the horse, their neurological and pathological evaluation.]—*Schweiz. Arch. Tierheilk.* 90. 615-647, 695-727. 1382

This is a very lengthy paper which does not lend itself to adequate summary, but it should be read by all those interested in behaviour and clinical signs of horses affected by nervous disorders.

Forty-seven horses were observed during life and were subjected to autopsy and examination of the brain and thus a great number of important neuropathological data are given. The diseases with which they were affected included meningo-encephalitis, meningitis, cerebral hyperaemia, traumatic conditions, cerebral oedema, hydrocephalus, staggers ("Leberkoller"), sclerosis and

This is not associated with losses of body weight in these animals.

It is concluded that the absolute amount of iron and/or phosphorus in the diet as well as the iron-phosphorus ratio influences the amount of iron absorbed.

calcification, and cerebral softening. Detailed descriptions are given of the behaviour of the animals during life and these are brought into line with the kind and localization of the lesion identified after death.—J. R. M. INNES.

INDERBITZIN, A. (1949.) Zitzenkrankheiten beim Rinde. [Diseases of the teat in cows.]—*Schweiz. Arch. Tierheilk.* 91. 739-745. 1383

A short clinical account of the pathological conditions which affect the teat canal, the milk sinus and the skin covering the teat.—E. G. W.

KAISER, R. (1948.) Die unterschiedliche Beurteilung des Scheidenkatarrhs der Rinder. [Differential diagnosis of vaginal catarrh of cattle.]—*Wien. tierärztl. Mschr.* 35. 377-379. 1384

K. regards vaginal catarrh not so much as a disease *per se*, but as a condition paving the way for uterine disease resulting in sterility. Vaginal catarrh has often been detected in quite young calves and K. believes it is a herd disease resulting from poor hygiene. He advocates a thorough and complete herd treatment [particulars not given] for its control.—J. E.

LAPIN, L., & STARKEY, H. (1949.) Hyaluronidase inhibitory substances in sera from patients with rheumatic disease. Parts I & II.—*Canad. med. Ass. J.* 60. 468-476. [Abst. from authors' summary and conclusions.] 1385

I. A review of the literature offering evidence of correlation between the histopathological findings in various "rheumatic diseases" and the concept of "diffuse collagen disease" has been presented. A general review of concepts of etiology in rheumatic disease has been presented with special emphasis placed on the rôle of haemolytic streptococci and of hyaluronidase.

II. Methods for studying antihyaluronidase titres in the sera of patients in relation to their clinical conditions have been described.

GUNNAR, R. M., & WEEKS, R. E. (1949.) Effect of tripeleannamine hydrochloride on burn shock.—*Arch. Path.* 47. 594-597. [Authors' summary slightly modified.] 1386

It has been found that tripeleannamine will prevent shock from developing after intravenous injection of histamine in g. pigs and dogs.



Burn shock was induced in 12 of 14 rabbits. Seven of the animals received large doses of tripeleannamine hydrochloride intravenously. No decrease of severity, delay of onset or inhibition of progression of shock was noted in the treated series. The treated series showed decreased viability.

MALCOLM, J., GRIESBACH, W. E., BIELSCHOWSKY, F., & HALL, W. H. (1949.) **Hyperplasia of the parathyroids associated with osteitis fibrosa in rats treated with thiouracil and related compounds.**—*Brit. J. exp. Path.* 30. 17-28. 1387

It has been observed that the administration of goitrogenic substances for prolonged periods induces thyroid hyperplasia and also causes enlargement of the parathyroids. The latter effect was studied in rats receiving goitrogenic substances in the food for periods up to 14 months, the thyroid hyperplasia being controlled by the simultaneous administration of thyroxine. The parathyroids from treated animals were greatly enlarged and lobulated. Oxyphilic cells predominated and these sometimes formed definite alveoli with a colloid-like substance at the centre. Bone changes characterized by bone destruction and the replacement of fatty marrow by fibrous tissue were also observed. The bone changes closely resembled those seen in osteitis fibrosa and it is suggested that this condition is caused by a hyperparathyroidism. No consistent changes were seen in the anterior lobe of the pituitary.

—J. A. NICHOLSON.

*See also absts.* 1525 (textbook, pathology); 1526 (book, liver injury); 1535 (book, animal ecology).

## POISONS AND POISONING

NAERLAND, G. (1948.) **Kobberforgiftning hos sau. [Copper poisoning in ewes.]**—*Norsk VetTidsskr.* 60. 161-185. [English summary.] 1390

N. discussed the literature on copper poisoning in sheep and described a case of acute poisoning in one sheep following overdosage with copper sulphate. More detailed descriptions were given of three outbreaks of such poisoning which occurred in flocks of 60, 32 and 40 sheep with 4-12 fatal cases in each outbreak. The sheep had either been given powdered copper sulphate (1 g. per sheep per day for 100 days) mixed with concentrate fodder or had free access to salt licks containing about 10% copper sulphate for periods of several weeks or months. Another outbreak occurred on a farm near a copper mine and it was suspected that the drinking water or the pasture herbage, or both, contained excess copper. The main symptoms and P.M. findings were described.

WATTS, C. F., & McDONALD, J. R. (1948.) **Pulmonary alveolar lining in bronchiectasis.**—*Arch. Path.* 45. 742-751. 1388

An account of the detailed histological examination of the bronchiectatic parts of 50 lungs removed surgically from human patients. The pathological changes were compared with those of ovine jagziekte. In the human cases the cells lining the cavities were rounded and cuboidal; their cytoplasm was vacuolated; they were frequently phagocytic; they were arranged in a single layer without papillary folds; the inter-alveolar septa were always thickened. In jagziekte the alveolar cells were square cuboidal or columnar, more frequently columnar; their cytoplasm was much clearer; they were rarely if ever phagocytic; they were arranged in several layers with frequent papillary folds; the interalveolar septa were not as thickened and were sometimes not thickened at all.—L. M. MARKSON.

VAGLIANO, M., & TSIRO, G. (1949.) **La gelure expérimentale chez les animaux. Le début et l'évolution de l'artérite chronique oblitérante. [Experimental frostbite in animals. The development and evolution of endarteritis obliterans.]**—*Rev. Path. comp.* 49. 595-604. [English summary.] 1389

Experimentally frostbitten rats, rabbits and dogs developed a progressive and eventually obliterating arteritis. This commenced in the exposed members, but months and even years later had spread to other parts of the body. The lesions observed duplicated those seen in frost-bitten men.—L. M. MARKSON.

These varied considerably from animal to animal, according to whether the final stages took an acute or a chronic course, but in every case they corresponded closely to the findings reported from other countries. In one fatal case the urine contained 1.1 mg. Cu per 100 ml. and the liver tissue (dry weight, fat included) 950 p.p.m. Cu.

On the farm where powdered copper sulphate was given mixed with concentrates it was the largest and strongest of the sheep which became affected.

N. recommends the establishment of supervision of commercial salt licks and mineral mixtures containing copper, which should bear a warning against continuous administration as anthelmintics, together with directions for use, especially for sheep.—F. E. W.

WACHSTEIN, M. (1949.) **Studies on inclusion bodies. I. Acid-fastness of nuclear inclusion bodies that are induced by ingestion of lead and**

bismuth.—*Amer. J. clin. Path.* **19.** 608-614. **1391**

Acid-fast intranuclear inclusion bodies were numerous in the cortical and subcortical zone of the kidneys of rats poisoned with lead acetate. Sections from material fixed in formalin were stained for three hours in carbol fuchsin at 56°C., washed, decolorized for 3-5 min. in acid alcohol (3 ml. of conc. HCl and 97 ml. of 70 % alcohol) and counterstained with Harris's haematoxylin. Degenerative changes in the epithelial cells had progressed in some cells to necrosis and secondary calcification. Lead could not be demonstrated histochemically. Control rats, given nickel or cobalt, had no inclusion bodies.

Acid-fast inclusions were also found within the nuclei and occasionally in the cytoplasm in sections of kidney from a human patient who had received weekly injections of bismuth for one year before death.

In material from a variety of other conditions in which intranuclear inclusions occur, including chronic pneumonitis, rabies, virus III infection in rabbits and canine distemper, there were no acid-fast inclusion bodies. It is suggested that the acid-fast character of the inclusions produced by Bi and Pb may be associated with a lipoid material produced in the damaged epithelial cells. The Ziehl-Neelsen stain is a convenient method of demonstrating these inclusions.—E. G. WHITE.

BENTLEY, H. R., McDERMOTT, E. E., PACE, J., WHITEHEAD, J. K., & MORAN, T. (1949.) **Action of nitrogen trichloride ('agene') on proteins: isolation of crystalline toxic factor.** [Correspondence.]-*Nature, Lond.* **164.** 438-439. **1392**

Crystalline material, which produced convulsive fits in rabbits, was obtained by the authors from separate batches of agenzized zein. The melting point of these crystals was similar; they gave the same colour reaction with ninhydrin and the toxicity remained the same after recrystallization. Corresponding material was entirely absent from unagenized zein purified in precisely the same way [see also *V. B.* **19.** 622].—E. M. J.

CAMPBELL, P. N., WORK, T. S., & MELLANBY, E. (1950.) **Isolation of a crystalline toxic factor from agenzized wheat flour.**—*Nature, Lond.* **165.** 945-946. **1393**

The authors isolated the toxic factor from agenzized wheat in crystalline form. The toxicity is discussed and the properties of these crystals are compared with those obtained from agenzized zein [see preceding abst.]. It appears highly probable that the material isolated from agenzized wheat flour is identical with that obtained from nitrogen trichloride treated zein.—E. M. J.

HELANDER, S. (1949.) **On the risk of urolith formation in treatment with sulfa preparations.**—*Acta med. scand.* **134.** 244-259. [In English, abst. from author's summary.] **1394**

The possibility of urolith formation from the administration of sulphathiazole, sulphadiazine, sulphamerazine or sulphadimethylpyrimidine was tested in rabbits to find the relationship between dosage, blood concentration and urolith formation.

A freeze-drying method was used for retaining the concretions in situ.

The uroliths were identified by fluorescence microscopy, polarization microscopy and melting-point determinations of the crystals in situ.

The risk of urolithiasis was found to be greatest in treatment with sulphathiazole, decreasing with sulphadiazine and sulphamerazine, and least with sulphadimethylpyrimidine.

In cases where the nature of the concretions could be established the question whether the uroliths consist of free sulpha drugs or of their acetyl derivatives, was found to be connected with the solubility of the respective substances and their blood concentrations.

Sulphadital, a drug composed of three different sulpha derivatives, involved a much smaller risk of urolith formation than the single compounds. The various drugs do not affect each others' solubility, which corresponds only to the individual concentrations but the therapeutic effect corresponds to the sum of the component concentrations.

Sulphadital has therefore two advantages: the risk of urolithiasis is reduced to a minimum at a normal dosage, and considerably bigger doses can be administered, in the case of resistant infections, without involving a greater risk than with the use of single compounds.

PLUVINAGE, R. J., & HEATH, J. W. (1946.) **Neural effects of DDT poisoning in cats.**—*Proc. Soc. exp. Biol., N.Y.* **63.** 212-214. **1395**

Progressive neurological symptoms were produced in cats by intramuscular injection of doses of D.D.T. dissolved in olive oil. Data, given for seven cats, indicate a marked variability of response, one animal dying after only 135 mg. per kg. in three injections, while another remained in good condition after having received a total dose of 665 mg. per kg. The sequence of symptoms was: stiffness, especially in the hind limbs, tremor, fine at first, rapidly becoming coarse and permanent, progressing into clonic movements, followed by death. Characteristic lesions consisted in diffuse degeneration of the ganglion cells throughout the brain with either vacuolar degeneration with swelling of the cell and disappearance of the Nissl bodies, or pyknosis. No alterations



were found in the liver other than moderate dilatation of the capillaries.—H. PAVER.

MÓCSY, J. (1946.) A kontaktmérgek. [On contact poisons.]—*Mag. Allatorv. Lapja*. No. 9. pp. 1–8. [Abst. from English abst.] 1396

Toxic symptoms were produced in cattle by dosage with D.D.T. at 0.11–0.13 g. per kg. body weight.—M. C.

JUDAH, J. D. (1949.) Studies on the metabolism and mode of action of DDT.—*Brit. J. Pharmacol.* 4. 120–131. [Author's summary copied verbatim.] 1397

The distribution of DDT in tissues and its absorption and excretion have been investigated.

Experiments on the metabolic fate of the drug indicate that DDA [2:2-bis (*p*-chlorophenyl) acetic acid.—Ed. V. B.] is the only metabolite. It is pointed out that small amounts of other substances may be produced. No conclusive evidence that DDT itself is the toxic agent can therefore be brought. Direct analysis shows that the HCl liberation theory is untenable in the mammalian species. It has also been found that DDA is relatively non-toxic.

Investigation of the blood chemistry in DDT intoxication shows that violent changes occur. The blood sugar rises and then tends to fall. Blood lactate rises to relatively high levels. These results are more pronounced in rabbits than in rats. The serum K of rabbits often presents high values; the serum Ca is never low, and is sometimes raised. Plasma protein, non-protein nitrogen, serum Na, Mg, and apparent inorganic P show no changes. Evidence is presented that the variations are probably secondary to the convulsive seizures suffered by animals poisoned with DDT.

Calcium gluconate affords a partial protection against DDT intoxication. It is shown that this is not because DDT causes a hypocalcaemia.

The relationship of liver damage to acute DDT intoxication was investigated. Though in some animals with long-standing, pre-existing liver damage DDT toxicity appears to be enhanced, with experimentally produced acute liver damage an opposite and paradoxical effect occurs. The problem of liver damage produced by chronic DDT poisoning remains unsolved. Liver glycogen is rapidly depleted in rats poisoned with a lethal dose of DDT.

Experiments with tissue slices and isolated rat diaphragm failed to show any important breakdown of DDT. Kidney, liver, brain, and intact diaphragm oxidized some 5 per cent of the DDT to DDA. The remaining 95 per cent was recovered unchanged. There appears to be no specific site for the breakdown of DDT.

Experiments on the respiration of tissues and on enzymes failed to show the mode of action of DDT. Inhibition of anaerobic glycolysis, which was found with liver and diaphragm, could not be demonstrated with brain cortex. DDT was also found to be without effect on the glycolytic enzymes in solution and on a variety of other enzymes. Some acceleration of aerobic respiration was observed with DDT in rat diaphragm and brain cortex slices (when the latter were exposed to the drug in the absence of substrate). The possibility that DDT might have an effect similar to dinitrophenol was shown to be untrue by the lack of effect of the drug on aerobic phosphorylation. Chemical estimation of pyruvic acid and lactate in the Warburg flasks showed that aerobic glycolysis was not increased in liver and muscle.

EVANS, W. C., & EVANS, E. T. R. (1949.) Poisoning of farm animals by the marsh ragwort (*Senecio aquaticus* Huds.). [Correspondence.]—*Nature, Lond.* 164. 30–31. 1398

An alkaloid, aquaticine, has been isolated from *Senecio aquaticus* in a yield of 0.04% of plant dry weight. Doses of 3–7 mg. of the acetate, injected subcutaneously killed rats of 60–70 g., within 48 hours. Death occurred within three weeks, with the typical lesions of seneciosis, when 20–40% of the dried and milled plant was included in the diet. These results indicate that *S. aquaticus* is probably as toxic to livestock as some of the other species of *Senecio* are known to be.

—NESTA DEAN.

ANON. (1949.) Investigations into the etiology and control of enzootic (toxaemic) jaundice of sheep. Report of the Investigation Committee for the year 1948–49.—*Aust. vet. J.* 25. 202–208. 1399

Studies were made on chronic copper poisoning and on heliotrope poisoning; both conditions may result in a haemolytic disease associated with jaundice.

It has been proved that *Heliotropium europaeum* is a poisonous plant, its toxicity being caused by the alkaloid lasiocarpine. The toxicity is low, grazing for two seasons being required to produce the characteristic liver lesions and death. Merinos, as well as cross-breeds, may be affected. Control of the disease depends on the suppression of heliotrope in the pastures, or allowing grazing on such pasture for one season only. Molybdenum supplements, which are beneficial in chronic copper poisoning, may be associated with a higher death rate among sheep grazed on heliotrope.

Chronic copper poisoning has been found to occur most commonly on pastures dominated by subterranean clover, especially on certain soil types when seasonal conditions favour luxuriant growth. Admixture of grasses in the pastures and

molybdenum supplements help to control the disease.—N. WICKHAM.

PURCHASE, H. S., & BRUCE, W. P. (1949.) Is *Cupressus macrocarpa* poisonous to farm stock? —*E. Afr. agric. J.* 14. 189. 1400

50 g. of fresh leaves of *C. macrocarpa* (not in flower), suspended in water, was given to each of two sheep, the dose being repeated three times at three-day intervals, without evidence of toxicity in either of the sheep.—R. MARSHALL.

ECKELL, O. A. (1946.) Las plantas toxicas para el ganado. Acción del *Cynodon hirsutus* Stent y del *Solanum pseudocapsicum* L.—Antecedentes para el mejor estudio de otros vegetales, sospechados de tóxicos, poco conocidos. [Poisonous plants in the Argentine. *Cynodon hirsutus*, *Solanum pseudocapsicum* and others.] —*An. Fac. Med. vet., Univ. La Plata.* 9. 11–52. 1401

*C. hirsutus*, a species of Bermuda grass, has been found to be toxic to horses under certain conditions, owing to its cyanogenetic properties. Fatal cases of poisoning in horses occur during a very wet spell of weather following a long period of drought. Fresh plants may contain 10 mg. hydrocyanic acid per kg.; the quantity increases in the dried grass.

See also *absts.* 1308–1310 (insecticides); 1372 (vitamin A); 1412 (streptomycin).

## PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

WILSON, G. S. (1948.) Preventive medicine. Presidential address.—*J. R. sanit. Inst.* 68. 220–225. 1402

At the beginning of this century, therapeutic vaccination had diverted bacterial research into a somewhat unfruitful path. The discovery of the part played by the human carrier in enteric fever and diphtheria also diverted attention from the more usual vehicles of water, milk, dust and air. Laboratories became fully occupied with "fee for specimen" work, and research and organized investigation and campaigns against disease fell rather into the background. Considerable improvement followed the organization of the Emergency Public Health Service, introduced originally to deal with the threats of impending total war. It is essential to realize that the National Health Service is intended to be preventive first and foremost, and full co-operation between all its branches is necessary to achieve this end.—R. MACGREGOR.

DAGAIN. (1947.) Thérapeutique cameline indigène chez les Touareg Ajjer. [Therapeutic treatment of camels by the Ajjer Touaregs.] —*Rev. vét. milit.* 2. 334–340. 1403

The symptoms are mainly those of a medullary affection, with irregular fever, tachycardia, paresis and paraplegia, incontinence of urine and retention of faeces. There is occasionally haematuria. The course of the disease varies from 8–10 days to 30–40 days.

The P.M. features include a slightly inflamed intestinal tract, liver somewhat hypertrophied and congested, icteric serosae, excess fluid in the pericardium, and severely congested kidneys. In the medulla there is slight meningeal congestion and superficial pinhead haemorrhages. On section there are foci of disseminated myelitis in the grey and white matter.

Experiments with *S. pseudocapsicum* indicated that it is toxic in the flowering and fruiting stages for g. pigs and rabbits, causing lesions of a congestive type in the liver, kidneys and intestinal canal. One horse, given the plant in a macerated form, developed colic and respiratory arrhythmia of short duration.

E. considers that the toxicity of other plants, *Clematis hilarii*, *Chenopodium album* and *C. hircinum*, species of *Asclepias*, and *Oxipetalum solanoides* should be investigated.

The article is well illustrated both in black and white, and in colour.—I. W. JENNINGS.

An account of the primitive methods of therapeutic treatment of camels by the Touaregs of the Ajjer district.—G. V. LAUGIER.

SCOTT, D. B., PICARD, R. G., & WYCKOFF, R. W. G. (1950.) Studies of the action of sodium fluoride on human enamel by electron microscopy and electron diffraction.—*Publ. Hlth Rep., Wash.* 65. 43–56. [Authors' summary slightly modified.] 1404

Electron micrographs have been made of replicas of the surfaces of enamel slabs treated with NaF solutions for lengths of time between 5 minutes and 30 days. Few visible surface changes were recognized when the treatment was less than a week. Small amounts of deposit were noted after 7 days. Greater quantities were seen after 15- and 30-day treatments. No deposit was visible after the prolonged washing of 30-day treated specimens. Preliminary but inconclusive tests were made of the relative acid solubilities of untreated enamel and enamel after immersion in NaF.

Electron diffraction patterns have been made from the surfaces of enamel slabs before and after immersion in NaF for periods from 3 minutes to



30 days. In all instances the original apatite pattern was converted to that of  $\text{CaF}_2$ . The  $\text{CaF}_2$  pattern reverted to that of apatite when specimens treated for 3 minutes with  $\text{NaF}$  were washed for 90 minutes in water, but when specimens treated for 30 days were washed for 6 days the reversion did not occur in all instances. Electron micrographs of surfaces after diffraction showed amounts of deposit to be expected from the treatments they had undergone.

WEST, H. D., JOHNSON, A. P., & JOHNSON, C. W. (1949.) The use of radioactive silver for the detection of abscesses and tumors. I. The concentration of  $\text{Ag}^{111}$  in spontaneous and experimentally induced abscesses.—*J. Lab. clin. Med.* 34. 1376–1379. [Authors' summary copied *verbatim*.] 1405

The radioactive  $\text{Ag}^{111}$  isotope concentrates in areas of infection. This isotope is excreted by the liver into the intestine presumably by way of the bile and the feces. Since both  $\text{Ag}^{108}$ ,  $^{110}$  and  $\text{Ag}^{111}$  concentrate in areas of experimentally induced and spontaneous infection, it is to be expected that other silver isotopes such as  $\text{Ag}^{106}$  for example, would behave similarly. Since  $\text{Ag}^{106}$  has a short half-life (8.2 days) and also emits gamma rays and is thus amenable to external survey, it is suggested that it might prove to be of value as a tool for the detection of obscure foci of infection in the animal body.

JACOBSON, L. O., SIMMONS, E. L., & BLOCK, M. H. (1949.) The effect of splenectomy on the toxicity of  $\text{Sr}^{89}$  to the hematopoietic system of mice.—*J. Lab. clin. Med.* 34. 1640–1655. [Authors' summary and conclusions copied *verbatim*.] 1406

Radiostrotrontium ( $\text{Sr}^{89}$ ), a  $\beta$ -ray emitter with a half-life of fifty-five days, is largely deposited in the skeleton when administered to the experimental animal. Although deposition in bone is general, the greatest concentration of this isotope invariably occurs in areas of active bone growth.

A persistent leucopenia but no anemia of significance was produced in the peripheral blood of young mice given a single intraperitoneal injection of this isotope as the chloride in a dose of 2.0 microcuries per gram. The same dose produced a leucopenia and an anemia in splenectomized mice. Recovery from the anemia was essentially complete by 119 days after the  $\text{Sr}^{89}$  injection. Hematopoiesis was markedly reduced in the bone marrow of all radiostrotrontium-treated animals within three days after injection. The epiphyseal and metaphyseal regions of the long bones were largely depleted of cells, or, in some instances, the latter regions were completely replaced by fibrous tissue. Recovery of hemato-

poiesis in the bone marrow of the femur was essentially complete by 119 days except that some cellular depletion still existed in the metaphysis at this stage.

Ectopic erythrocytopoieses and megakaryocytopoiesis were greatly increased in the spleen three days after  $\text{Sr}^{89}$  injection as was true of all other intervals studied through 119 days. Splenic lymphocytopoiesis, on the other hand, was reduced in three days and recovery was not complete by 119 days. Lymphocytopoiesis was essentially unaffected in other lymphatic tissues (lymph nodes, thymus, etc.). Ectopic granulocytopoiesis increased more slowly in the spleens of  $\text{Sr}^{89}$ -injected animals, reaching a maximum at circa sixty days. Ectopic granulocytopoiesis, megakaryocytopoiesis, and erythrocytopoiesis were not remarkable in other tissues of the animals which received  $\text{Sr}^{89}$ .

The rapid development and the persistence of ectopic erythrocytopoiesis in the spleen prevent anemia in mice given  $\text{Sr}^{89}$  intraperitoneally in a dose of 2.0 microcuries per gram.

KRANTZ, J. C., JR., CARR, C. J., BUBERT, H. M., & BIRD, J. G. (1949.) Sugar alcohols. XXVII. Drug allergy in the canine family.—*J. Pharmacol.* 97. 125–128. [Authors' summary copied *verbatim*.] 1407

The dog and certain other members of the genus *Canis* have been shown to exhibit an allergic response to polyoxyethylene derivatives of hexitol anhydride partial fatty acid esters. Other species, including man, in other families appear to enjoy an immunity to this allergic type response.

MAKSIĆ, D. (1948.) Blutübertragung beim Pferd. [Blood transfusion in horses.].—*Dtsch. tierärztl. Wschr.* 55. 328–331. 1408

Several hundred blood transfusions were given to horses with various diseases (severe haemorrhage, acute and chronic cases of anaemia [presumably including cases of equine infectious anaemia], eczema, etc.) using fresh blood and an apparatus designed to prevent clotting. A slide agglutination test (donor's erythrocytes, recipient's plasma) showed when blood samples were incompatible, but false positive agglutinations often occurred so that considerable experience was necessary in reading the test. In cases of severe haemorrhage one transfusion of 4–6 l. was given and in fevers and chronic anaemia repeated transfusions of 1–3 l. were given. Delayed haemolysis and "idiosyncrasy" were not observed.

M. pointed out that in Germany there is great risk of transmission of equine infectious anaemia by blood transfusions.

He concluded that blood transfusions were generally valuable only as adjuvants.—M. L.

HIRSCH, A. (1950.) **The assay of the antibiotic nisin.**—*J. gen. Microbiol.* 4. 70-83. [Author's summary copied *verbatim*.] 1409

Nisin, which does not diffuse quickly through agar, may be assayed by dilution methods, or, because it is bactericidal and not merely bacteriostatic, it may be assayed by estimating numbers of surviving bacteria.

Nisin in low sublethal concentration simply prolongs the lag-phase of *Streptococcus agalactiae*; in higher sublethal concentrations it also induces fast-growing resistant strains. In both cases the delay can be accurately related to nisin concentration, growth being measured in terms of acid production.

STRAIT, L. A., DUFRENOY, J., PRATT, R., & LAMB, V. (1948.) **Enhancement of penicillin effectiveness by traces of cobalt.**—*J. Amer. pharm. Ass.* 37. 138-135. [Authors' summary copied *verbatim*.] 1410

Addition of  $\text{CoCl}_2 \cdot 6\text{H}_2\text{O}$  in concentrations of 0.1 to 10 parts per million to the test agar used in assaying penicillin by the cylinder-plate technic causes pronounced increases in the diameters of the zones of inhibition that are formed on plates seeded with *S. aureus*, *E. coli*, *P. vulgaris*, and *B. subtilis*. The effectiveness of penicillin, as measured by this test, is increased two- to four-fold. Interpretations of the data and possible therapeutic applications are discussed briefly.

UNGAR, J. (1950.) **Penicillin in tissue exudates after injection.**—*Lancet.* 258. 56-59. [Author's summary copied *verbatim*.] 1411

The intramuscular injection of small amounts of turpentine into animals is a convenient method of obtaining frequent samples of sterile exudate. After intramuscular injection of penicillin, detectable amounts remain in the fluid of damaged tissue for about twice as long as in the bloodstream. The therapeutic effect of single massive doses of penicillin is partly explained by the prolonged accumulation of penicillin in the inflamed tissue.

DOMON, C. M., KILBOURNE, P. C., & KING, E. Q. (1949.) **A clinical study of the toxic effects of dihydrostreptomycin and streptomycin.**—*Amer. Rev. Tuberc.* 60. 564-575. [English and Spanish summaries, English summary copied *verbatim*.] 1412

Ten patients were treated with streptomycin sulfate, 3.0 Gm. per day for a maximum of ninety days, and 9 patients were treated with dihydrostreptomycin, 3.0 Gm. per day for ninety days. All patients were observed daily for toxic manifestations, and weekly tests of caloric response were conducted. None of the patients treated

with dihydrostreptomycin showed any signs or symptoms of streptomycin toxicity during the period of treatment or for seven weeks thereafter. Eight of the streptomycin-sulfate-treated patients developed symptoms of vestibular damage and subsequently lost their caloric response, even though treatment was usually stopped shortly after the onset of symptoms. The remaining 2 streptomycin-sulfate-treated patients showed no signs of toxicity in any form. The characteristic signs and symptoms of vestibular damage were always followed or accompanied by complete loss of caloric response whether treatment had been discontinued or not. No significant hearing loss was noted in either group of patients during or after treatment.

PENNEY, J. R., & BALFOUR, B. M. (1949.) **The effect of vitamin C on mucopolysaccharide production in wound healing.**—*J. Path. Bact.* 61. 171-178. [Authors' summary copied *verbatim*.] 1413

The production of acid mucopolysaccharides in the early stages of normal wound healing in guinea-pigs has been confirmed. There is a failure in the production of these substances in the wounds of guinea-pigs depleted of vitamin C. The intramuscular injection of ascorbic acid to depleted animals results in the prompt appearance (within twelve hours) of muco-polysaccharides in the wound. The sequence of events in wound healing is discussed.

LE VAY, D., & LOXTON, G. E. (1950.) **Clinical observations with deoxycortone and ascorbic acid.**—*Lancet.* 258. 209-211. [Authors' summary copied *verbatim*.] 1414

In the majority of 80 cases of rheumatoid arthritis, deoxycortone and ascorbic acid reproduced the phenomena reported by Lewin and Wassen. A similar response was obtained in monarticular infective arthritis, ankylosing spondylitis, and gonococcal arthritis, and benefit may be obtained in traumatic states. Evidence is given for believing that the action of these substances is peripheral.

KJERULF-JENSEN, K. (1948.) **The effect of sodium iodide compared with that of diiodotyrosine on the thyroid gland.**—*Acta med. scand.* Suppl. no. 213. pp. 247-254. [In English. [Author's summary copied *verbatim*.] 1415

A comparison has been drawn between the absolute and the relative contents of colloid substance and parenchyma respectively in the thyroids of rats after peroral administration of 2-thio-4-methyl-uracil, sodium iodide, sodium iodide plus methylthiouracil, and diiodotyrosine plus methylthiouracil respectively.



Administration of methylthiouracil alone caused, as might be expected, a considerable increase in the parenchyma content of the thyroid, whereas the absolute amount of colloid substance remained unchanged.

Administration of sodium iodide alone resulted in an absolute increase in the amount of colloid substance. Diiodotyrosine and sodium iodide (when equivalent with regard to iodine) both have the same repressing effect on the cellular hyperplasia caused by the simultaneously added methylthiouracil; but they bring about an absolute increase in the amount of colloid substance despite the concurrently administered methylthiouracil.

MEITES, J., & AGRAWALA, I. P. (1949.) **Effects of underfeeding on thiouracil action in rats and mice.**—*Endocrinology*. 45. 148–152. [Authors' summary copied *verbatim*.] 1416

The influence of underfeeding on the response of the thyroid gland to either constant or varied amounts of thiouracil was determined in fifty-eight mature female rats and in fifty-nine mature and immature male mice. Thiouracil was injected subcutaneously in the form of an aqueous suspension at the rate of 10 mg. daily or was fed in the ration as a 0.1 or 0.2 per cent mixture. Food intake was restricted by feeding either 3/4 or 1/2 of the feed consumed daily by *ad libitum*-fed controls.

It was found that on a 100 gm. body weight basis, the underfed and *ad libitum*-fed animals which received the same amount of thiouracil showed the same increases in thyroid weight, while the animals which received less thiouracil showed reduced thyroid responses. These results suggest that thyroid secretion in underfed rats and mice is reduced only in proportion to loss in body weight.

BERRY, L. J., STARR, R. W., & HALLER, E. C. (1949.) **The effect of surface-active agents on phagocytosis.**—*J. Bact.* 57. 603–611. 1417

It was found that several surface-active agents when incubated with human or mouse blood, defibrinated or heparin-treated, or when injected intraperitoneally into mice, increased the phagocytic activity of leucocytes *in vitro* to about double the normal. Although repeated injections into mice of the surface-active agent "Triton N-100", the most active of them, maintained the phagocytic power of the leucocytes at a high level *in vitro*, the animals were not protected against experimental infection with *Salmonella typhimurium*. This may be explained by the fact that bacteria, if incubated with these agents, are less easily phagocytosed than controls, and in the *in vivo* experiments the bacteria are exposed to the

action of the agent as well as the leucocytes.

—A. MAYR-HARTING.

COLLIER, H. O. J., & TAYLOR, E. P. (1949.) **Paralysing activity of some heterocyclic decamethylene- $\omega$ -bis quaternary ammonium salts.** [Correspondence.]—*Nature, Lond.* 164. 491–492. 1418

In studies on these substances of the chemical arrangement within the molecule it has been established that the optimal mammalian paralysing effect is obtained when two quaternary nitrogen atoms are connected by a chain of ten ( $\text{CH}_2$ ) groups, *i.e.*, a decamethylene chain. In an effort to simulate some of the tubocurarine effects, the groups attached to these quaternary nitrogens were modified. All 11 compounds had some paralysing activity but much less than *d*-tubocurarine chloride.—MALCOLM WOODBINE.

PHILLIPS, C. R., & KAYE, S. (1949.) **The sterilizing action of gaseous ethylene oxide. I. Review.**—*Amer. J. Hyg.* 50. 270–279. 1419

PHILLIPS, C. R. (1949.) **The sterilizing action of gaseous ethylene oxide. II. Sterilization of contaminated objects with ethylene oxide and related compounds: time, concentration and temperature relationships.**—*Ibid.* 280–288. 1420

KAYE, S. (1949.) **The sterilizing action of gaseous ethylene oxide. III. The effect of ethylene oxide and related compounds upon bacterial aerosols.**—*Ibid.* 289–295. [Authors' summaries copied *verbatim*.] 1421

I. Ethylene oxide, a gas at ordinary temperatures and pressures, has been noted by various workers to be bactericidal. A review is presented of the information available in the literature on this subject, together with other pertinent information on the insecticidal properties of ethylene oxide, on its inflammability and toxicity and on available analytical methods for this compound.

II. Data have been presented which show the effect of temperature, concentration and exposure time upon sterilization with gaseous ethylene oxide. From these data it appears that the coefficient of dilution of the compound is close to unity and that the temperature coefficient, 2.74 for each 10-degree C rise, is not unusually high. The relative resistance to ethylene oxide of 7 other representative species of bacteria has been shown to be considerably less than that of *Bacillus globigii* spores.

Other compounds containing the same epoxy [a 3-membered ring consisting of two carbon atoms and an oxygen atom as in ethylene oxide.—Ed. V.B.] grouping have also been shown to possess bactericidal properties, as do compounds containing the 3-membered ethylene sulfide or ethylene imine [a 3-membered ring in which the O atom of ethylene oxide is replaced by NH—

Ed. V. B.]rings. Cyclopropane, however, and heterocyclic carbon and oxygen compounds having 5- and 6-membered rings, were not active against bacteria. Although some of the other compounds screened are more active against bacteria than ethylene oxide, it is not certain that they will prove more valuable in practical sterilization.

III. An apparatus is described in which the effect of vapors upon the viability of bacterial

See also absts. **1183** (dicumarol<sup>(R)</sup>); **1184** (*Pneumococcus*); **1185-1188** (mastitis); **1189** (rat-bite fever); **1199-1202** (TB.); **1210** (*E. rhusiopathiae* infection); **1211** (drug resistance); **1212** (fowl cholera); **1215** (*S. typhi* infection); **1220** (trace elements and brucellosis); **1233** (*Candida albicans* infection); **1235** (bovine contagious pleuro-pneumonia); **1237** (cyanide and trypanosomes); **1239** (*Tr. foetus* infection); **1292** (chloromycetin); **1304** (allergy and nicotamide); **1308-1313**, **1315** & **1317** (insecticides); **1320-1321** (D.D.T. sprays); **1326-1327** (ticks); **1328** (mites); **1329-1330** & **1332** (anthelmintics); **1333** (D.D.T. and tapeworm larvae); **1334** (pernicious tapeworm anaemia); **1336** (strongyle larvae); **1337** (heartworm); **1339** (mouse tumours); **1357** (calcium therapy); **1359** (piglet mortality); **1375** (vitamin B<sub>12</sub>); **1376** (vitamin T); **1378** (metabolic disorders); **1381** (fowl pox and spirochaetosis); **1386** (burn shock); **1387** (thyroxine); **1390** (copper); **1394** (sulphonamides); **1446** (heparin); **1447** (ascorbic acid); **1472-1475** (hormone therapy); **1481** (canine haemophilia); **1521** (book, antibiotics); **1534** (book, hormone therapy).

## PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

RUTENBURG, A. M., SELIGMAN, A. M., & FINE, J. (1949.) Studies with radioactive iodized fat. I. Preparation of radioactive fat with observations on the absorption of fat following subcutaneous and intraperitoneal injection in dogs. —*J. clin. Invest.* **28**. 1105-1109. [Authors' summary copied verbatim.] 1422

RUTENBURG, A. M., SELIGMAN, A. M., & FINE, J. (1949.) Studies with radioactive iodized fat. II. The tissue distribution of emulsified fat following intravenous administration.—*Ibid.* **1110-1116**. [Authors' conclusions copied verbatim.] 1423

I. A method for preparing radioactive iodized oil is described. Following subcutaneous or intraperitoneal injection of emulsions of this oil, absorption was slow and nearly all of it remained at the site of injection. Hyaluronidase did not increase the rate of absorption of tagged fat from the subcutaneous or peritoneal space.

II. An emulsion of radioactive iodinated fat injected intravenously in dogs and mice leaves the circulation rapidly.

Approximately 60% of the radioactivity still present in the circulation 24 hours after injection is contained in the lipid fraction of the plasma and 20% in the ionic fraction.

Immediately after injection, the highest concentration of radioactivity in the tissues of dogs is found in the spleen, lung and liver, in that order, and decreases slowly. In tissues of mice the concentration of radioactivity immediately after injection is highest in the lungs. There it drops rapidly, while the concentration of radioactivity in the spleen increases rapidly and remains high for six to eight days after injection.

Iodine is gradually and slowly liberated from the iodinated fat and excreted. Iodinated fat is not stored in mesenteric fat depots.

aerosols may be determined. Several compounds, containing a 3-membered heterocyclic ring, were found to be highly bactericidal for aerosols of *Bacillus globigii* spores.

Ethylene imine and some of its derivatives were found to be much more bactericidal than ethylene oxide, or its methyl, chloromethyl or bromomethyl derivatives. Ethylene sulfide displayed an activity intermediate between those of the oxygen- and the nitrogen-containing rings.

BRADFIELD, J. R. G., & ERRERA, M. (1949.) Ultra-violet absorption of living cells. [Correspondence.] — *Nature, Lond.* **164**. 582-583. 1424

A study was made of the extent to which ultra-violet light is absorbed by living cells.

Species of *Paramecium*, *Spirostomum* and *Rhabditis* were used and (a) erythrocytes of frog, fowl and mouse, (b) certain loose-cell sarcomata, and (c) myeloblasts, erythroblasts and other stem cells from bone marrow, as well as lymphocytes and thymocytes (all from mice), and examined under various wavelengths, both after the time required for visual perception and that required for photography and absorption measurements.

All the cells absorbed ultra-violet radiation at wavelengths around 2,600 Å. In group (a), after a slight decrease, the absorption increased markedly and reached twice its initial value after 5 min. irradiation. In group (b), absorption was marked from the outset and showed little change, while in group (c) the initial amount had fallen by about 15% after 3 min. The fall in group (c) could be arrested by switching off the light or, during continued irradiation, by the presence of sulphhydryl inactivators. Various hypotheses in regard to its mechanism are discussed.—G. P. M.

PEARCE, R. H., & WATSON, E. M. (1949.) The mucopolysaccharides of human skin.—*Canad. J. Res. Sect. E*. **27**. 43-57. 1425

These biochemical studies were carried out by a modification of the method employed by Meyer and Chaffee (1941) for pig skin. While the products obtained by this method were not pure, the degree of their contamination was uniform and did not contribute an appreciable error to the results. The mean values and standard deviations for the concentrations of hyaluronic acid and of chondroitin sulphuric acid fractions isolated from



11 samples of normal skin were found to be  $24.5 \pm 5.7$  and  $26 \pm 4.7$  mg. per 100 g. of fresh skin, respectively. Less hyaluronic acid was observed in the skin of women than in that of men.—R. GWATKIN.

FRADA, J. (1949.) **Concerning some aspects of splenic physiopathology.**—*Acta med. scand.* 135. 308–325. [Abst. from author's summary.] 1426

F. concluded from experiments which he carried out on human beings and dogs, that normally, after a meal, the spleen contracts. The mechanism of such digestive splenocontraction, which has a tonic quality, is exclusively humoral and, as the observations on duodenum-excluded subjects reveal, has its starting point in the duodenum; it is caused by the circulation of a splenocontractile principle duodenosplenic elaborated by the duodenal mucosa. There is a deficiency in this splenotonic principle in cases of duodenitis and successive appearance of an atonic congestive tumour of the spleen. This in its turn may be responsible for hepatic changes—partly owing to the consequent modifications in the portal circulation. Therefore in addition to the duodenum and the spleen, the liver may be involved.

F. discusses the significance of digestive splenocontraction; some of his findings also appear to indicate a participation of the spleen in the processes of metabolism and from these he regards the duodenum as an organ that supervises the processes of digestion and of metabolism.

BENJAMIN, J. M., Jr., & HORVATH, S. M. (1949.) **Temperature measurement inside the body using a thermistor.**—*Science.* 109. 592–593. 1427

The authors describe the use of an instrument using the name thermistor, which was approximately ten times as sensitive as thermocouples for the measurement of temperature. The instrument can be incorporated into a fine catheter, thus making possible the exact measurement of internal temperatures. Some results with a dog under nembutal anaesthesia were:—rectal temperature  $99.1^{\circ}\text{F}$ . right ventricle  $99.0^{\circ}\text{F}$ ., femoral vein  $96.8^{\circ}\text{F}$ ., and thigh surface  $92.8^{\circ}\text{F}$ .—J. A. N.

PROCTOR, D. F., & HARDY, J. B. (1949.) **Studies of respiratory air flow. I. Significance of the normal pneumotachogram.**—*Johns Hopk. Hosp. Bull.* 85. 253–280. [Authors' summary copied verbatim.] 1428

Experimental analysis of normal pneumotachograms has substantiated the hypothesis that portions of the respiratory pattern are true reflections of the activity of the respiratory musculature, the effectiveness of lung elasticity, and the manner in which reversal of respiratory effort is accomplished.

Study of records taken during maximum respiratory effort provides information facilitating a classification of the factors controlling the ventilation reserve; the ability rapidly to reach high flow velocities, and the time during which such high flow velocities can be maintained, and the time required for reversal of direction of flow of air.

The pneumotachogram yields information about the manner in which the organism adapts the respiratory apparatus to added resistance to breathing, especially when combined with studies of the alveolar-atmosphere pressure gradient.

BARROW, P. S. (1949.) **The muscles of the head and forelimb of the dog.**—*Thesis, Cornell.* pp. 29. 1429

A detailed study of the musculature of the head and forelimb of the dog with 40 excellent hand drawn illustrations.—H. L. GILMAN.

GREIG, M. E., & HOLLAND, W. C. (1949.) **Increased permeability of the hemoencephalic barrier produced by physostigmine and acetylcholine.**—*Science.* 110. 237. 1430

Following the observation that a disturbance of the acetylcholine-cholinesterase system affects the permeability of dog erythrocytes, experiments were carried out with frogs to determine whether other cells were also affected when this system was disturbed. In the frog, acid fuchsine passes the haemoencephalic barrier and causes convulsions after some delay, the time of onset and degree of convulsions depending on the amount of dye in the cord. When physostigmine, a specific inhibitor of cholinesterase, together with acetylcholine and the dye were injected into the lymph sac of frogs, the average time before convulsions set in was 34 min. whereas when control frogs were injected with acid fuchsine alone, the average time before onset of convulsions was 12.6 hours. The authors consider that the acetylcholine-cholinesterase system probably plays an important part in maintaining the normal permeability of the living cell.—J. A. NICHOLSON.

LI, C. H., INGLE, D. J., PRESTRUD, M. C., & NEZAMIS, J. E. (1949.) **Lack of effect of lactogenic hormone upon organ weights, nitrogen and phosphorus balance, and the fat and protein content of liver and carcass in male rats given lactogenic hormone.**—*Endocrinology.* 44. 454–457. 1431

It has been suggested that the lactogenic hormone may exert metabolic effects on other organs besides the mammary gland. Experiments were therefore carried out with male rats given a carbohydrate fluid diet and injected with 1 mg. lactogenic hormone daily for ten days. When killed, no differences were noted in the liver,

stomach, intestines, kidneys, testes, thymus or adrenals nor in the fat and protein content of the liver and carcass of the treated and control animals.

—J. A. NICHOLSON.

RUPP, J., PASCHKIS, K. E., & CANTAROW, A. (1949.) **Influence of thyroxine on protein metabolism.** — *Endocrinology*. 44. 449–453. 1432

In order to determine whether thyroxine induces nitrogen retention, the output of urinary N was estimated in normal and thyroidectomized force-fed rats. Following thyroidectomy, the urinary output of nitrogen increased from 78–88% of the N intake, but this fell to 62% after the daily administration of 5–10 µg. of thyroxine, i.e., the normal output of the rats' thyroid. Such dosage, however, had no effect on normal rats. Larger doses of thyroxine induced protein catabolism in both normal and thyroidectomized rats. On the other hand, in hypophysectomized rats the small physiological doses of thyroxine failed to reduce the output of urinary N. It is concluded that pituitary function may be a pre-requisite for the protein anabolic effect of thyroxine, but the nature of this synergism between the thyroid and the pituitary is at present uncertain.—J. A. N.

NICHOLS, C. W., JR., CHAIKOFF, I. L., & WOLFF, J. (1949.) **The relative growth of the thyroid gland in the bovine fetus.**—*Endocrinology*. 44. 502–509. 1433

The growth of the thyroid gland in relation to body growth was studied in 121 bovine foetuses the ages of which ranged from 62 days to full term. The simple allometry equation was found to fit the data for the growth of the thyroid in relation to body weight, body length, and age. The relative-growth constant for thyroid weight against body weight was 1.0, indicating that the thyroid weight is nearly directly proportional to body weight over the range of data studied. The equation relating thyroid weight to body weight was :—

Thyroid weight (mg.) =  $[0.25 \times \text{body weight (g.)}]^{1.0}$

Percentage growth rates of the foetal thyroid (i.e., instantaneous relative growth rate  $\times 100$ ) were found to decrease with increasing age; at 60 days the percentage growth rate was 10.2% per day; and at 220 days it was approximately 2.8% per day.—A. T. COWIE.

HANSEN, R. G., & PHILLIPS, P. H. (1949.) **Studies on proteins from bovine colostrum. III. The homologous and heterologous transfer of ingested protein to the blood stream of the young animal.**—*J. biol. Chem.* 179. 523–527. 1434

Electrophoretic analyses indicated that new proteins appear in the blood of young kids follow-

ing the ingestion of goat, cow or pig colostrum. These proteins had identical electrophoretic mobility with the principal "immune proteins" of the ingested colostrum. Other colostrum and milk proteins did not appear in the blood stream as such. Evidence was obtained, however, to suggest that the young calf can obtain "immune proteins" directly from ingested normal milk.

—J. A. NICHOLSON.

MEITES, J., & TURNER, C. W. (1948.) **Studies concerning the induction and maintenance of lactation. I. The mechanism controlling the initiation of lactation at parturition. II. The normal maintenance and experimental inhibition and augmentation of lactation.**—*Bull. Mo agric. Exp. Sta.* No. 415. pp. 5–65; & No. 416. pp. 3–36. 1435

I. This is a detailed review of the work of Turner and his co-workers on the physiological mechanisms controlling the initiation of lactation at parturition. The greater part of the experimental data described and discussed herein have already been published. The authors conclude that, in general, recent experimental data support their theory that, during pregnancy, progesterone in the blood overrides the stimulating effect of blood oestrogens on the secretion of prolactin by the pituitary; then, at the time of parturition, oestrogen becomes predominant and is able to evoke a rapid rise in the prolactin secretion of the pituitary and milk secretion is therefore initiated.

II. Experimental data relevant to an understanding of the mechanism involved in the maintenance of lactation are reviewed and certain procedures for decreasing or increasing milk production are discussed. The importance of the suckling stimulus for continued milk secretion is stressed. Small quantities of oestrogen are considered to be useful for augmenting milk production, particularly if thyroid preparations are also given in amounts sufficient to overcome any unfavourable effects of oestrogen on metabolism, such as reduction in food intake.—A. T. COWIE.

COCHRANE, E. R. (1949.) **Observations on a reflex controlling milk flow in the individual mammary gland of the cow.**—*Brit. Vet. J.* 105. 320–321. 1436

After an injury to the teat wall, milk escaped rapidly from the wound after the "let-down" had taken place. The flow of milk, however, could be stopped by touching the teat and it was not resumed for half a minute or longer. The flow of the other three quarters was not affected during this period. It is concluded that the opening between the gland and teat sinuses can be reflexly closed by contraction of smooth muscle, thus preventing the milk from entering the teat



sinus. Such a mechanism would explain why milkers believe that some cows can "hold up" their milk in one or two quarters while letting it down from the others.—A. T. COWIE.

SYKES, J. F., WRENN, T. R., & UNDERWOOD, P. C. (1949.) **Observations on mammary gland development of dairy heifers induced by hormone injections.**—*J. Dairy Sci.* 32. 707. [Only abst. given.] 1437

Two heifers were injected with stilboestrol, three with stilboestrol + progesterone, two with stilboestrol + crude pituitary extract, and two with stilboestrol + progesterone + pituitary extract. Two uninjected heifers were kept as controls. Injections were started at one month of age and continued to nine months. At five months of age, histological examination of the mammary glands revealed glandular development of an abnormal type in all the injected heifers. Progesterone did not appear to affect the development. At nine months of age all the heifers had lobule-alveolar development and in general this was more advanced in those which had received pituitary extract in addition to the steroid (?) hormones.

[Neither dosage used nor frequency of injections are stated and some confusion is caused by classing "stilboestrol" as a "steroid" hormone.]—A. T. COWIE.

COTES, P. M., CRICHTON, J. A., FOLLEY, S. J., & YOUNG, F. G. (1949.) **Galactopoietic activity of purified anterior pituitary growth hormone.**—*Nature, Lond.* 164. 992–993. 1438

A single subcutaneous injection of purified anterior pituitary growth hormone in cows in declining lactation produced a significant increase in milk yield during the two days following inoculation as compared with the two preceding days. Doses of 60 mg. of the hormone produced no greater galactopoietic effect than 30 mg. The same pituitary hormone has thus been shown to produce growth, secretion of extra milk (present paper) or diabetes, according to the age, species and condition of the treated animal: this varied effect may be explained by an action of the hormone in restraining oxidative processes of food-stuffs, this restraint being manifested either by laying down new tissue, by secretion of extra milk or by diabetes according to the conditions under which the hormone acts.

Injection of 28 mg. of adrenocorticotrophin caused a significant depression of milk yield. Prolactin in doses of 40 mg. had no positive galactopoietic effect and the simultaneous administration of prolactin and adrenocorticotrophin with growth hormone did not influence significantly the galactopoietic effect of the latter.

Groups of 3–4 cows were used on each of three farms and the results on each farm were in general agreement. Saline was used as a control inoculation on each farm.—E. G. WHITE.

RICHARDSON, K. C. (1949.) **Contractile tissues in the mammary gland, with special reference to myoepithelium in the goat.**—*Proc. roy. Soc. Ser. B.* 136. 80–45. [Author's summary copied verbatim.] 1439

The distribution of myoepithelium and smooth muscle in the lactating mammary gland of the goat has been examined by a new technique of silver impregnation which is applicable to sections up to 100 $\mu$  in thickness. Myoepithelium covers the stromal surface of the epithelium of the alveoli, ducts and cisterns of the entire gland, and is thus much more abundant than is generally realized. Smooth muscle forms scattered interlobular bundles closely associated with the blood vessels. The theory that myoepithelial contraction is the principal factor concerned with 'let-down' and the ejection of milk is examined; other factors such as interlobular smooth muscle contraction, vascular changes, and elastic recoil of the stroma appear to play minor roles, if any, in this phenomenon. Hitherto, it has been assumed that myoepithelial cells are contractile because they bear structural resemblances to smooth muscle fibres. With the new technique structural changes have been found in the myoepithelium of contracted as compared with distended alveoli and ducts. These changes, together with the general orientation of myoepithelial cells, and the precise relationship between these cells and the folds in the secretory epithelium from contracted glands, are consistent with the assumption that myoepithelium is the contractile tissue in the mamma which responds to a neurohormonal mechanism involving oxytocin.

COWIE, A. T., & FOLLEY, S. J. (1949.) **Relative growth of the mammary gland in the normal, gonadectomized and adrenalectomized rat.**—*J. Endocrinol.* 6. No. 1. pp. vi–vii of Proceedings. 1440

The relative rate of increase in mammary gland area from the 2nd to the 100th day of age was studied in intact rats of both sexes and in rats gonadectomized or adrenalectomized one day after weaning (*i.e.*, the 22nd day). Adrenalectomized rats were given 1% saline instead of drinking water. In intact females growth of the mammary glands was isometric for the first 23 days and then became allometric. Ovariectomy at the 22nd day resulted in isometric growth of the mammae. Adrenalectomy at the 22nd day had no significant effect on the relative growth rate of the mammae in the intact female. In the intact male rat

mammary growth showed a very slight allometry over the whole period and this was not significantly affected by castration at 22 days. Adrenalectomy in male animals caused a slight increase in mammary growth, but this is considered of doubtful significance because of the effect of this operation on metabolism and thus on the relation between body weight and surface area.—E. G. WHITE.

FARBIAK, J. P. (1947.) Die Beziehungen zwischen Fibrinogengehalt, Senkungsgeschwindigkeit und Retraktion des Pferdeblutes. [**Relationship between fibrinogen content, sedimentation rate and coagulation of horse blood.**]—*Inaug. Diss., Wien*. [Abst. from abst. in *Wien. tierärztl. Mschr.* 36. 43. (1949).] 1441

The fibrinogen content of the blood of 15 healthy horses varied from 0.23–0.7%. There was no relation between the coagulation rate or the sedimentation rate and the fibrinogen content. The erythrocyte sedimentation rate was increased by the addition of fibrinogen but not by other blood plasma globulins.—E. G.

JABLONSKI, A. (1946.) Über den Einfluss geringer Alkali- und Säuremengen auf die Blutsenkungsreaktion im Zitratblut von Pferden. [**Influence of small amounts of acid and alkali on the sedimentation rate in citrated horse blood.**]—*Inaug. Diss., Vienna*. [Abst. from abst. in *Wien. tierärztl. Mschr.* 35. 188. (1948).] 1442

The sedimentation rate of horse erythrocytes was retarded by the addition of hydrochloric acid and accelerated by the addition of sodium hydroxide, the extent of these effects being conditioned by the amounts used. The effect in either case lasted only for about half an hour, after which the sedimentation occurred at normal times.

J. suggested that these results were produced by alteration in the normal weight balance between blood corpuscles and plasma.—E. G.

BAYER, E. (1947.) Ein kapillaradsorptives Phänomen der Serumfarbstoffe des Pferdes. [**A capillary adsorption phenomenon of the serum pigment of the horse.**]—*Inaug. Diss., Vienna*. [Abst. from abst. in *Wien. tierärztl. Mschr.* 35. 509. (1948).] 1443

When one end of a strip of filter paper is immersed for 24 hours in normal horse serum a yellowish brown band appears on the upper portion remote from the serum, comprised of albumin-bound bilirubin. The same phenomenon occurs with serum from haemolysed blood or serum from which the globulins have been salted out.

BARADLAI, O. (1946.) Über die Verteilung des Blutzuckers zwischen Blutkörperchen und Plasma beim Schaf. [**Distribution of the blood sugar between blood corpuscles and plasma in**

**the sheep.**]—*Inaug. Diss., Vienna*. [Abst. from abst. in *Wien. tierärztl. Mschr.* 35. 185. (1948).] 1444

The average of the sugar determinations in plasma and corpuscles of jugular blood of 12 healthy, normally fed sheep was 49.5 and 20.25 mg. per ml. respectively.—E. G.

BLOCK, M. (1949.) **Erythrocytopoiesis in the nervous system of the embryonic rat.**—*Blood*. 4. 1156–1167. 1445

An examination of the nervous system in foetal rats from the 11th day of development until birth on the 21st day. Vascularization of the nervous system begins on the 12th day and the blood cells are derived from the blood islands of the yolk-sac, the sole erythropoietic organ at this stage. On the 13th and 14th days vascularization of the nervous system proceeds, and mesenchymal cells may now be seen in the perivascular spaces lying close to the endothelium. Erythroblasts from the yolk-sac are seen in the circulation and erythropoiesis has begun in the liver.

Thereafter the perivascular mesenchymal cells increase in number and all stages of transition into haemocytoblasts may be observed. Maturation from the haemocytoblasts follows the usual sequence. Aggregates of erythroblasts are found in characteristic locations in the nervous system. The stages of erythropoiesis are thus seen in the perivascular spaces of the nervous system.

—G. F. R.

STOKER, S. B. (1949.) **Bacteriostatic action of heparin.**—*J. Physiol.* 110. p. 26 of Proceedings. [Only abst. given, copied *verbatim*.] 1446

In previous communications, Stoker & Pollard (1946) reported that, as a result of trauma, heparin was released into the blood stream in measurable quantities.

The function of the heparin thus released has been investigated. It was found that in the presence of blood from the region of an injury or in the presence of pus, heparin had a marked bacteriostatic action. This action was not shown by the addition of heparin to pure strains of *Staph. aureus* but was exhibited when the culture was contaminated with a minute addition of pus or trauma blood. The inference is that a co-factor present in trauma blood or pus is necessary for heparin to act as a bacteriostatic agent. This action has been confirmed by the clinical use of heparin (0.44–0.05 unit per ml. in normal saline) in the local treatment of septic conditions. The pain, the congestion and oedema associated with inflammatory conditions and burns are relieved.

THÉRIEN, M., LEBLANC, J., HÉROUX, O., & DUGAL, L. P. (1949.) Effets de l'acide ascorbique sur plusieurs variables biologiques



normalement affectées par le froid. [The effect of ascorbic acid on biological changes normally affected by cold.]—*Canad. J. Res. Sect. E. 27.* 349–363. [In French; English abstr. copied *verbatim*.] 1447

It has been shown recently by Dugal and Thérien that during a short or long exposure to cold, the normal hypertrophy of the adrenals is completely prevented by large doses of ascorbic acid, and that, nevertheless, at the same time, resistance is increased towards the same damaging agent. So, the most universally accepted criterion of damage caused by stress is abolished when the animals exposed to cold receive large doses of ascorbic acid. Starting from that observation, it was natural to wonder what would be the effects of the ascorbic acid on the biological changes normally associated with the hypertrophy of the adrenals during exposure to cold. The present paper describes the experimental studies made in that connection; the results obtained show that: (1) ascorbic acid (a) partly inhibits the thymus atrophy normally encountered upon exposure to any stress including cold, (b) accelerates in a very significant way the enlargement of the thyroid, (c) is responsible for an increase in weight of the spleen, whereas the control animals, on the contrary, show a decrease in weight of the same organ; (2) the histamine content of the adrenals, which increases at room temperature under the influence of ascorbic acid, is significantly decreased during exposure to cold under the influence of the same substance; (3) the activity of the adrenals, far from being inhibited by ascorbic acid is even increased if the cholesterol changes are taken as an index of that activity; (4) the initial hypotension—due to cold—found in our controls, is prevented by large doses of ascorbic acid; on the other hand, if hypertension develops after long exposure to cold, the subsequent administration of large doses of ascorbic acid restores the blood pressure to normal. Confirmation has also been obtained for the previously reported observation that ascorbic acid prevents the hypertrophy of the adrenals during exposure to cold.

HANCOCK, J. L., & ROWLANDS, I. W. (1949.) *The physiology of reproduction in the dog.*—*Vet. Rec.* 61. 771–779. [Discussion pp. 777–779.] 1448

Observations on the physiology of reproduction were made on a colony of dogs maintained for breeding puppies for experimental purposes. The season of onset of oestrus varied greatly as did the periodicity of oestrus. Of 35 bitches only two came into oestrus in their first year. Investigations on the cellular content of the vaginal smear were in agreement with reports of previous workers. It is considered that a high conception

rate may be expected if the first mating is permitted during the first four days of oestrus and is followed by a second mating two days later. Examination of vaginal smears during pregnancy and pseudo-pregnancy failed to reveal any characteristic differences. The clinical diagnosis of pregnancy is considered to be uncertain during the first five weeks and any diagnoses made then should be confirmed during the seventh week. Some evidence of a seasonal variation in the viability of litters was obtained, the death rate among puppies being higher during the winter months. No satisfactory evidence was obtained in support of the belief that high neo-natal death rate is a result of infection of the bitches with haemolytic streptococci. Intramuscular injections of stilboestrol may be of value in accelerating the onset of oestrus in parous bitches when heat has been delayed. The administration of 3 mg.  $\alpha$ -tocopherol per day to bitches throughout pregnancy appeared to reduce the neo-natal death rate. The technique of artificial insemination is described.

In discussion on the paper, Amoroso, E. C., stated that it is possible that in the bitch, as in the g. pig and rat, oestrus is induced by the conditioning action of oestrogens followed by the action of progesterone produced in the maturing follicle. In greyhounds about 10–15% of all ovulated ova are eliminated by loss, death or defective fertilization.—A. T. COWIE.

THIBAUT, O. (1949.) *Les facteurs hormonaux de la régulation chimique de la température des homeothermes. [Hormonal factors in chemical regulation of temperature in mammals.]—Rev. Canad. Biol.* 8. 3–131. [English summary slightly modified.] 1449

In this project, we have aimed at an exhaustive quantitative study of the hormonal factors involved in the chemical regulation of temperature in the white rat.

The separate and conjugate ablation of the thyroid and adrenal glands enabled us to determine the thermoregulatory capacity of each group of operated rats with relation to the normal rat, thereby establishing the respective roles of each one of the hormonal factors. 14% of the total regulatory capacity is attributed to the thyroid. 40% of the total regulatory capacity is attributed to the adrenals. The ablation of both these glands in the same animal produced the same value—54% for this “thyroid and adrenal” system. This result attests to the accuracy of our procedure. It is apparent from these results that 46% of the thermoregulatory capacity is dependant on factors other than the thyroid and adrenal glands and so we set about to investigate the source.

The establishment of these preliminary facts

served as a starting point for a more detailed study of each of the endocrine glands involved in the phenomenon of the chemical regulation of temperature. With regard to the adrenals, we have shown that the rôle in this chemical regulation is due to adrenalin. Contrary to other workers on this subject, we were unable to demonstrate that the cortical hormones played a direct part in the thermoregulation. According to our observations, they would seem to be involved only indirectly, namely, through their relationship with the metabolism of water and salts.

We noted that the thyroid has an important function in reflex thermogenesis after thermosteresis. It intervenes directly in raising the basal metabolism, and thereby increasing the thermoregulatory margin. It sensitizes the enzymatic systems of oxidation, those which participate in the thermoregulation, to the action of adrenalin. With regard to this indirect function, a precise and detailed study of the reinforcing action of thyroxin on adrenalin was undertaken, showing that:—the sensitizing effect of thyroxin was independent of its effect on the oxidations and that there was a quantitative relation between the action of adrenalin on the thermal exchanges and the tissue concentration of "active thyroxin".

We have proved experimentally that the factors which, in the absence of the thyroid and adrenals, still furnish about half of the thermogenic needs after thermosteresis, are of hypophyseal origin as hypophysectomy results in a complete loss of thermoregulatory ability. Consequently, the temperature of thermal neutrality in the rat is no longer accepted as 30 degrees but 35 degrees centigrade; any drop in external

temperature under 35 degrees centigrade brings about a fall in the central temperature in hypophysectomized rats; the instigation of the calorogenic response on exposure to cold by the hypophysectomized rats is slow and progressive, while in rats without both the thyroid and adrenal glands, it is sudden, rapid and efficacious. Aside from its well-known indirect role through the intermediary of the thyroid and adrenals, the *hypophysis* thus enters directly into thermoregulation through the action of a hormone for which the work of O'Donnovan & Collip has indicated as its localisation, the "pars intermedia".

PEARSE, A. G. E. (1949.) **The cytochemical demonstration of gonadotropic hormone in the human anterior hypophysis.**—*J. Path. Bact.* 61. 195–202. [Author's summary copied *verbatim*.] 1450

In the sheep and ox the pituitary gonadotropic hormones are mucoproteins, as are the chorionic gonadotropins in man and animals.

The periodic acid-Schiff method can be used as a histochemical test for mucoproteins, *inter alia*, and by its use the gonadotropic hormone in the cells of the hypophysis can be localised. The hormone is found to be present in the basiphils and in the "colloid" of both stalk and parenchyma.

A particular type of vesiculate chromophobe has been described and it is suggested that this may represent a phase in the secretory cycle of the basiphil.

Positive-staining material is found in the human and animal placenta and in the cells of chorionepithelioma; this may represent the chorionic gonadotropin.

See also *absts.* 1245 (chloride in blood); 1350 (metabolism); 1501 (epithelial cells of bronchioles); 1527 (book, anatomy and physiology); 1529 (book, blood); 1530 (book, cytology); 1532 (book, heat regulation); 1533–1534 (books, hormones).

## PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

CALDER, W. B. (1947.) **Milk : a food for thought.**—*J. R. sanit. Inst.* 67. 259–263. Discussion pp. 263–265. 1451

The quality of the milk supply to the town of Chester had consistently improved with regard to both bacteriological and chemical tests since 1905; propaganda among the producers played an important role in the work that led to this improvement. In 1943 only 5.3% of the samples yielded counts of more than 200,000 bacteria per ml. In 1946 tubercle bacilli were, however, still present, so pasteurization was advisable. C. considered that the accredited milk scheme was useless and should be abandoned.

Examination of 19 samples from one farm giving milk of low quality, revealed that in June and July 1937, 18 of the cows were giving

milk deficient in fat but above the minimum in solids not fat, whereas six samples were high in fat (4.6%) and had only 8.4% solids not fat in December. The freezing point test is essential to prove the fraudulent addition of water to milk.

—R. MACGREGOR.

BUSS, W. (1949.) **Nachweis von Tuberkelbakterien in der Milch mittels Alkohol-Probe (AP).** [Demonstration of tubercle bacilli in milk by the alcohol test.]—*Tierärztl. Umsch.* 4. 268–270. 1452

The addition to normal cow's milk of an equal volume of 36% alcohol gives no precipitate, whereas milk from cows with mastitis gives a precipitate within a few minutes. The first floccules come to the surface of the milk-alcohol mixture and tubercle bacilli can be demonstrated



in smears of this material. B. developed a method of examining milk for tubercle bacilli by this method which is claimed to be superior to the ordinary microscopic examination of the deposit and cream from centrifuged milk and which takes less time to carry out.

In a glass cylinder 8 cm. high and 2.7-3.0 cm. wide are placed 20 ml. of 36% alcohol (containing also 0.01 ml. of glacial acetic acid per 100 ml.); 20 ml. of the milk sample are poured in rapidly and the mixture is left to stand for 5-10 min. Using a platinum loop of 4 mm. diameter 5-6 samples of the surface precipitate are transferred to an area of about 1-1.5 cm. diameter on a slide. The slide is left to dry in the air, fixed by heat and stained by Ziehl-Neelsen (2 min. with heated carbol fuchsin and about 30 sec. with acid alcohol). The microscopic picture is clear and organisms are found readily.

Comparison with the routine microscopic method (19 samples positive) indicated that the alcohol method (27 samples positive) was more effective in picking out positive samples (81 milk samples were examined by the alcohol method, ordinary microscopic method and some of them also by culture on Petragani medium). Time is saved because there is no need to centrifuge the sample and one thick smear only is examined. The presence or absence of precipitation when alcohol is added gives a preliminary idea as to whether the sample of milk is "normal" or not.

G. pig inoculation was not used as a control method and the sole comparison was between the alcohol technique and the routine microscopic and cultural methods used in the German laboratories.—E. G. WHITE.

ARCHIBALD, J. G. (1949.) **Nickel in cows' milk.**—*J. Dairy Sci.* 32. 877-880. [Author's summary copied *verbatim*.] 1453

Nickelous chloride was fed as a supplement (500 mg. daily) to the rations of 6 cows for a period of 2 months by the double reversal method and the milk was analyzed for nickel. [The cows were divided into two groups, (i) being given the control ration only, (ii) being given supplementary nickel. After two months (i) was given supplementary nickel and (ii) the control ration only for a further two months.—Ed. V.B.] Although varying amounts of nickel were found in the numerous milk samples taken, it was shown that when the milk was kept from contact with metal by milking directly into glass jars, nickel was not present. Therefore it was concluded that nickel is not a constituent of natural milk and that the varying amounts found in the course of the investigation came from the milking machine. The difference in this respect between cobalt and nickel, two closely related elements, is discussed briefly.

NEAVE, F. K., & HOY, W. A. (1947.) **The disinfection of contaminated metal surfaces with hypochlorite solutions.**—*J. Dairy Res.* 15. 24-54. 1454

Shallow tinned trays were used and trials were made with *Staph. aureus*.

The nearest approximation to the quantity and thickness of films on farm dairy utensils was found by smearing 1 ml. of a 9% whole-milk suspension over an area of about 1 sq. ft. More reproducible results and more survivals were obtained by putting the suspension on the tinned trays in droplet form and drying before use, the dried surfaces being disinfected by rinsing with sodium hypochlorite solution.

Even if utensils have contained sour milk, there will be less than 5,000,000 bacteria per sq. ft. left on their surfaces after an ordinary thorough washing. To ensure sufficient survivals for accurate estimations after a 99.9% reduction it was necessary to use heavy infections of trays, 100 to 300 millions. Counts below 3,000 per tray could only be estimated roughly.

Disinfectant solutions were prepared with sodium hypochlorite at pH 9.3-9.9, containing 200 p.p.m. available chlorine. The loss of chlorine during use on the infected trays was only 2-3 p.p.m. after 5-15 min. exposure.

Apart from exceptionally resistant organisms few surviving bacteria remain after solutions containing 200 p.p.m. chlorine have been in contact with an infected surface for half a min., provided that the pH of the solution is not over 11.

There is a reduction in the efficiency of hypochlorites when the amount of organic matter per unit area is increased, *i.e.*, when the thickness of the dried-milk film is increased. The diameter as well as the thickness of the films is a controlling factor on the rate of destruction of the bacteria trapped in the film, as is that of the tenacity of the films and their resistance to hydration and penetration by the solutions. Butter-fat markedly reduces the efficiency of hypochlorite.

Spraying for 10 sec. is slightly less efficient than rinsing the trays for 1-2 min. The addition of a wetting agent increases considerably the efficiency of the spray if it is capable of removing much of the film.

There are 24 tables and graphs.—P. S. G.

SAKKAL, F. B. (1945.) **Le chameau animal de boucherie. [The camel as a slaughter animal.]**—*Thesis, Alfort.* pp. 155. 1455

From the title of this work the reader would imagine that the paper would be confined to a discussion on camel flesh, but this is not so, for the author delves into the history of the camel and relates many eastern customs and anecdotes connected with this animal as well as describing

other interesting matters concerning camel management.

Working capacity, the camel population of the world, breeding, gestation, parturition, the occurrence of abortion and many other matters are discussed.

Camel flesh is often deficient in fat, which is usually limited to the subcutaneous tissue, the abdominal cavity and the hump. The carcass of a castrated camel is the best, that of the female comes second, but both these are superior to the flesh of the uncastrated male. The author describes the types of slaughter-houses used in the east, especially those of Syria. He discusses the various methods of slaughter in force in different countries. The Mohammedan methods are by cutting the throat, or frequently by severing the arteries at the base of the neck; the Russian method is carried out, or used to be, by tying the standing animal to a cross beam before bleeding. Death does not take place for two to three minutes and the corneal reflex persists for five minutes. The Mongolian method in which the belly is opened and even the heart removed before death, is especially barbaric, but it is thought that this procedure is no longer practised. A plea is made for electric stunning before bleeding.

A description of the general anatomical features of the camel is given. Abnormalities of the carcass are described and details given of the diseases, specific and non-specific and those caused by parasites. At the present time the consumption of camel flesh is limited to nomad tribes and to a limited number of the urban population. In an appendix the manner of preserving camel flesh is described.

S. concludes by enumerating the following findings:—The muscle fibres of camel flesh are thicker than those of the ox. Camel meat varies in colour from strawberry to brownish-red, the fat being white. The flesh tastes sweetish. The water-content of camel meat is higher than that of either the ox or the horse. Camel meat matures more quickly than beef.—D. S. RABAGLIATI.

BLOUNT, W. P. (1949.) **The public health aspects of poultry disease.**—*J. R. sanit. Inst.* 69. 359–366. Discussion: pp. 366–371. 1456

B. points out that there is no legal requirement in Great Britain for an examination of poultry carcasses, either in the shops or elsewhere. On the other hand, it is an offence for anyone to expose for sale a carcass that is known to be diseased. In practice, only in a few places are poultry carcasses examined and then only a small percentage of them.

The author pointed out that the following diseases are known to be transmissible from avian to human hosts: TB., salmonellosis, *Erysipelothrix*

(*Listeria*) *monocytogenes* infection, favus, aspergillosis, thrush and psittacosis, and he raised the question of whether fowl typhoid, helminth infections, fowl cholera, many tumours including carcinomata, jaundice, rickets, nephritis and fowl paralysis may be transmissible to human beings.

The author concludes that speaking generally there is but little danger to the public from the consumption of uninspected poultry meat cooked as is the practice in Great Britain, although there might be some danger in handling lesions of *Erysipelothrix rhusiopathiae* infection. Doubtless the law allows a meat inspector to condemn many carcasses which would be quite incapable of producing ill-health were they to be cooked and eaten.

In discussion on the paper R. F. Gordon pointed out that in the U.S.A. inspection of poultry meat was not compulsory, but most plants processing poultry meat did apply to the Bureau of Animal Industry for veterinary inspection. He stressed the possibility of birds poisoned by phosphorus, zinc phosphide or arsenic being a danger to human beings if eaten, even if the majority of birds so poisoned would have died and so have been rejected on that score. It was surprising that the Americans should have included anthrax in the list of suspected diseases.

—D. S. RABAGLIATI.

SCHOENE, W. (1949.) **Auslösung von "Fleischvergiftungen" beim Meerschweinchen. ["Food poisoning" (Salmonella enteritidis infection) from sausages. G. pig tests.]**—*Berl. Münch. tierärztl. Wschr.* No. 10. pp. 137–140. 1457

*S. enteritidis* var. *danyesz* was isolated from sausages which had caused symptoms of food poisoning in human beings within two hours of ingestion. Oral or subcutaneous administration of broth cultures of the organism to a small number of g. pigs caused a rise of temperature within three hours, followed by death in some cases. The organism was isolated from all the organs and tissues of g. pigs which died. Administration of culture filtrates had no ill effect and it was concluded that symptoms of food poisoning in man which occur within a few hours of eating meat infected with *S. enteritidis* are caused by the bacteria and not by toxin.—E. G. WHITE.

STARNES, M. B. (1949.) **Veterinary food inspection service of the armed forces.**—*J. Amer. vet. med. Ass.* 114. 388–392. 1458

The Army Veterinary Service has, in the course of two wars, become the main food inspection service of the U.S. forces. It is now the rule that, when a contract is made for the supply of food-stuffs, the Quartermasters Corps calls on the General of the army group concerned to supply Veterinary Officers to inspect the material. Some-



times area-wide Veterinary services are built up to inspect the supplies of several camps and depots. To fit them for this, Army Veterinary Officers receive special training in the Meat and

Dairy Hygiene School at Chicago. The Army Food Service has a laboratory of its own, that frequently co-operates with other laboratories.

—R. MACGREGOR.

See also absts. 1191 (tubercle bacilli in milk); 1194 (TB. control); 1402 (preventive medicine).

## LIVESTOCK HYGIENE

WELLS, W. F. (1945.) **Sanitary ventilation by radiant disinfection.**—*Sci. Mon.*, N.Y. 60. pp. 325–334. 1459

It is now known that virulent organisms may be present in atomized droplets which remain suspended in the atmosphere thus forming a ready means for the spread of infectious diseases. The need for disinfection of the atmosphere is well recognized in operating theatres and is accomplished by means of ultra-violet radiation. This can effectively sterilize large volumes of air provided that the relative humidity does not exceed about 60%. An account is given of the application of ultra-violet radiation to hospital wards, school class-rooms and public transport vehicles. The chief difficulty is the prevention of direct exposure to the rays, but this has been overcome by means of light curtains and other devices. It is pointed out that a community is entitled to expect a pure air supply as well as other sanitary amenities.

—J. A. NICHOLSON.

WILSON, H. (1949.) **Disease and sewage sludge. Risks of transmission of disease through the use of sewage sludge as fertilizer.**—*J. Inst. Sewage Purif.* 1. 78–81. [Abst. in *Brit. Abstr. B III*. October. p. 441 of absts. (1949), copied *verbatim*. Signed: L. KLEIN.] 1460

Raw sewage sludge may contain viable organisms responsible for anthrax, bacillary and amoebic dysentery, typhoid, tuberculosis, hook-

See also abst. 1342 (soil fertility).

worm, roundworm, tapeworm, poliomyelitis, and possibly leptospirosis and brucellosis. There is no record during the past 100 years of any outbreak of disease definitely attributable to the use of sludge as fertiliser; reasons for this are discussed. Use of unsterilised sludge as a surface dressing for vegetables is condemned. Means of rendering sludge safe for use as fertiliser are discussed (heat sterilisation, chemical methods, composting).

STAPLEDON, R. G. (1948.) **Pastures old and new. The animal's point of view.**—*Agriculture, Lond.* 55. 231–234. 1461

From his own observations and discussions with "practical" men, S. postulates that grazing animals possess an instinct for selecting from a pasture the types and amounts of the different herbage required to satisfy their nutritional requirements.

A modern ley offers a small number of grass species all at the same stage of growth, and whilst supplying adequate protein and starch equivalent an excess water content may be present in wet weather. Permanent pasture contains numerous species belonging to a variety of natural orders and provides minerals and trace elements. For practical purposes a balance may be obtained when one-sixth to one-third of the total grass is permanent.—E. J. H. FORD.

## REPRODUCTION AND REPRODUCTIVE DISORDERS

BURKHARDT, J. (1949.) **Sperm survival in the genital tract of the mare.**—*J. agric. Sci.* 39. 201–203. 1462

A group of 13 barren pony mares were "teased" every 48 hours and as soon as a mare came into oestrus the ovaries were examined three times daily for follicular development, the mare being served as soon as a follicle of adequate size was detected. As ovulation can be induced 40–48 hours after injection of pregnancy urine extract, a spermatozoa survival time of any desired period from 24 to 100 hours could be given. Seven matings, in which there were spermatozoa survival times of 66–76 hours resulted in seven pregnancies, six matings with an interval of 90–100 hours gave five pregnancies, and one mare in which ovulation

occurred naturally, between 126 and 136 hours, also became pregnant. Three stallions of good fertility were used, and the results indicate that three days at least may be left between services in commercial studs, which, in many cases, would mean only one service for each heat period.

—J. O. L. KING.

INEICHEN, B. (1948.) **Über Untersuchungsmethoden von Stiersperma. [Methods of examination of bull semen.]**—*Schweiz. Arch. Tierheilk.* 90. 57–74. 1463

This is a discussion of the literature on the characteristics of bull semen and of methods of examining it for the purposes of artificial insemination.

Of the methods for the collection of semen,

only the artificial vagina (Cambridge pattern) is mentioned. Volume, colour, consistency and number of spermatozoa per ejaculate are briefly dealt with; the investigation of motility and density is dealt with in more detail and a detailed account is given of data and methods relating to the incidence of abnormal spermatozoa, to hydrogen-ion concentration, as well as to sperm respiration and resistance. A brief mention is made of abnormal constituents found in semen.

—G. P. MARSHALL.

VANDEMARK, N. L., SALISBURY, G. W., & BRATTON, R. W. (1949.) **Oxygen damage to bull spermatozoa and its prevention by catalase.**

—*J. Dairy Sci.* 32. 353-360. 1464

To determine the effect of oxygen on stored semen the authors used series of four 1 ml. samples of diluted semen treated by the following procedures:—oxygen was blown over the surface; nitrogen was blown over the surface; stoppered under air in large tubes; stoppered under air in small tubes.

One series of four tubes was incubated for one hour at 46.5°C., and two series stored at 5°C. for four and ten days. At the end of these treatments determinations were made of spermatozoa motility, sugar loss and lactic acid gain.

To determine the effect of adding beef liver catalase to stored semen the same number of samples as before were treated as follows:—(a) 0.1 ml. phosphate buffer with 0.2-0.4 units of catalase and stored under air; (b) as (a) but oxygenated; (c) 0.1 ml. phosphate buffer and stoppered under air; (d) as (c) but oxygenated.

Three series of tubes were treated as before and spermatozoa motility determined. Results are considered in detail, the general conclusions being that near anaerobic conditions of semen storage are desirable and that the increased amount of hydrogen peroxide produced by unavoidable mixing during transit would be rapidly removed by added catalase.

An experiment to test the effect of added catalase on conception rates is being carried out.

—E. J. H. FORD.

BRANTON, C., BRATTON, R. W., & SALISBURY, G. W. (1949.) **Semen production and fertility of dairy bulls fed rations containing proteins of plant and animal origin.**—*J. Dairy Sci.* 32. 292-300. 1465

Using bulls of the following breeds:—11 Friesian, six Guernsey, and one Ayrshire, studies were conducted to relate differences in measurable semen characteristics and relative fertility to concentrate mixtures containing as protein supplements, skim milk powder (animal origin) or maize gluten feed or soya bean oil meal (vegetable

proteins). Each concentrate mixture contained 16% protein and timothy hay was used as the only roughage. The results judged by the averages of volume of semen per ejaculate, percentage of motile spermatozoa, number of spermatozoa per cu. mm. of semen, the methylene blue reduction time and the percentage of usable samples during a 120-day period indicated that the two kinds of protein supplements were approximately equal in value.

Based on 60-90 days non-returns to first service the average fertility levels of the semen produced were 61.6% for the milk powder, 63.5% for maize gluten feed, and 65.7% for soya bean oil meal. The differences are relatively small and it is doubtful if the last is really superior.

Consistent body weight increases were observed for all bulls during the first 240 days and consistent decreases during the last 120 days. The reason for this decrease is not apparent.

—J. O. L. KING.

HERRICK, J. B. (1949.) **Laboratory and field technique to determine fertility in the bull.**—*J. Amer. vet. med. Ass.* 115. 87-90. 1466

In this discussion of clinical and laboratory methods of determining fertility in the bull, H. admits that such methods can at best provide a reasonable estimate, while the conception rate remains the only positive test.

He outlines points to be observed in (a) the physical examination, (b) the diagnosis of diseases causing infertility brought about by the organisms *Trichomonas foetus*, *Brucella abortus* and *Vibrio foetus*, (c) the precautions to be taken in the collection and handling of semen, describing briefly the tests for the examination of the latter, i.e., field tests for quantity, appearance, motility and pH; and laboratory tests including methylene blue reduction, longevity, bacterial counts, morphology, and spermatozoa count.—G. P. MARSHALL.

UMBAUGH, R. E. (1949.) **Superovulation and ovum transfer in cattle.**—*Amer. J. vet. Res.* 10. 295-305. 1467

The use of gonadotrophins for producing superovulation in cows was investigated as a preliminary step to undertaking the transfer of ova from cow to cow. So far as the methods of transfer were concerned two main possibilities were studied, (1) the collection, fertilization and transfer of ovarian ova and (2) the collection and transfer of fertilized tubal and uterine ova. The method of superovulation finally adopted was to implant subcutaneously wax pellets containing 1,500 rat units of a sheep pituitary preparation, while removing at the same time, by palpation, any corpora lutea present in ovaries; then four days later 1,000 r.u. of the same gonadotrophin were injected intravenously. Superovulation did



not occur unless the intravenous injection was given, and the injection was effective as early as two days or as late as nine days after implantation. Doses of sheep anterior pituitary ranging from 1,500–3,000 r.u., when implanted in pellet form and followed by an intravenous dose of 500–1,500 r.u., resulted in superovulation. Ova were collected from the ovaries by aspiration of the ripe follicles 26 hours after the ovulatory injection of gonadotrophin, the ovaries being reached through a ventral or flank incision. Approximately six ova per animal were recovered by this technique, although an average of 20 follicles per cow were aspirated, the loss of ova being the result of technical difficulties in aspiration. Ova collected by this method were transferred to the fallopian tubes of recipient cows, in some cases the ova were mixed with bull semen *in vitro* before transplantation, in other cases the recipient cows were inseminated 19 hours before the ova were deposited in the tubes, and other animals had semen injected into the fallopian tube a few minutes before the ova. None of these recipient cows became pregnant and it was concluded that ovarian ova were not promising material for ova transfer studies.

Fertilized ova were collected from the fallopian tubes of superovulated cows by washing out the tubes of both slaughtered and living animals, semen having been deposited *in utero* at the time of injection of the ovulatory dose of gonadotrophin and again one day later.

Unsuccessful attempts were made to obtain superovulation by using pregnant mares' serum gonadotrophin (250–5,000 i.u.) as the priming material, followed by an intravenous dose of 1,000 r.u. sheep pituitary.

The fate of superovulated ova in the oviducts was studied in 41 cows. These were slaughtered 3–6 days after the ovulatory injection. An average of 23.4 ova per cow were recovered. Whilst most of the ova collected were in the fallopian tubes at the third day, by the fourth day the majority were in the uterus, indicating a somewhat early passage into the uterus.

Twenty-one cows implanted with 2,000 r.u. sheep gonadotrophin were injected with 2,000 or 10,000 i.u. chorionic gonadotrophin, but the yield of fertilized ova was not so high as that obtained using sheep pituitary gonadotrophin. The injection of oestrogens or progesterone at the time of, or after, the intravenous injection of gonadotrophin also failed to improve the yield of fertilized ova.

A five-day injection schedule of priming doses of pituitary gonadotrophin (50–100 r.u. per day) followed on the sixth day by a low intravenous dose (25–50 r.u.) also gave superovulation and a good recovery of fertilized ova.

Fertilized ova were transferred to the oviducts of three cows. All three became pregnant but they aborted before the fetuses reached full term.—ALFRED T. COWIE.

GILBREATH, J. C., & DAVIS, G. T. (1949.) A fertility study with turkeys using different concentrations of semen.—*Poult. Sci.* 28. 406–410. 1468

In this study of the effect of semen dilution upon the fertility of young Bronze turkeys, 40 hens were divided into four groups of 10, each treated four times in 54 days with semen from four toms. Within each group, the hens were divided into five groups of two, each group receiving a different fraction of semen (diluted with normal physiological saline to 1:10, 1:20, 1:50 and 1:100) from the same tom.

When the eggs were checked for fertility, on the fifth day of incubation, the results were closely similar for all four toms, but the difference between the effects of the various fractions was highly significant statistically, the fertility percentages being as follows:—undiluted: 84.25%; diluted: 1:10, 39.61%; 1:20, 33.69%; 1:50, 16.87%; 1:100, 5.51%.—G. P. MARSHALL.

HAINES, M., & FERREIRA, H. P. (1949.) Pregnancy test using a European male toad. [Correspondence.] — *Nature, Lond.* 164. 668. 1469

The male common toad, *Bufo bufo* is a suitable test animal for detecting gonadotrophic hormone in the urine in the diagnosis of human pregnancy. 2.5 ml. of an eluate of the urine is injected into the toad; 70 tests carried out by this method were all correct.—A. T. COWIE.

HAMBURGER, C., & ØSTERGAARD, E. (1949.) Investigations into the quantitative determination of antihormones against pregnant mares' serum hormone.—*Acta endocrinol.* 2. pp. 1–10. [In English, authors' summary copied *verbatim*.] 1470

A total number of 574 immature female rats were injected subcutaneously with mixtures of a commercial preparation of pregnant mares' serum gonadotrophin and an antigonadotrophic serum from rabbits treated for two months with another sample of the hormone.

The uterine and ovarian weights obtained in rats treated with various combinations of hormone and antiserum were compared with the corresponding dose-response curves obtained in animals treated with pregnant mares' serum gonadotrophin alone. From these curves the amount of hormone neutralized by the antiserum was calculated.

The small doses of serum were found to be relatively much more effective than larger quantities, and the antigonadotrophic "titer" of the

serum could, therefore, with equal justification be calculated as any value between 25 and 274. Since the laws governing the reaction between gonadotrophin and antigonadotrophin are as yet unknown, any statement concerning the "titer" of an anti-serum is of little value.

A rough estimate of the activity of an anti-gonadotrophic serum may be obtained, when the conditions of assay are strictly standardized.

HÖHN, E. O., & ROBSON, J. M. (1949.) **Mode of action of oestrogens on the corpus luteum.**—*Endocrinology*. **44**. 536-541. 1471

Crystals of oestradiol dipropionate (in doses ranging from 5-18  $\mu\text{g}$ .), stilboestrol (5-15  $\mu\text{g}$ .) and 1% oestradiol in cholesterol (60  $\mu\text{g}$ .) were implanted into one corpus luteum of pseudo-pregnant rabbits and the animals were hypophysectomized the following day. Four to 25 days later the animals were killed and the ovaries examined microscopically. In no case was an implanted corpus luteum maintained selectively, but the corpora lutea in both ovaries were either equally maintained or degenerated to a like degree. The result suggested that the maintenance effect of oestrogen on the corpora lutea of hypophysectomized rabbits is not a direct action on the luteal cells but is brought about through some indirect mechanism.—ALFRED T. COWIE.

MARSHALL, S. P., BECKER, R. B., ARNOLD, P. T. D., & SANDERS, D. A. (1948.) **Effect of stilbestrol on udder development, pelvic changes, lactation and reproduction.**—*Bull. Fla agric. Exp. Sta.* No. 440. pp. 35. [Authors' summary and conclusions copied *verbatim*.] 1472

The synthetic estrogen stilbestrol was injected subcutaneously as an oil-suspension into 5 open cows and 14 open heifers.

The mammary tissues of most of the heifers developed rapidly and began secretion. The first-drawn milk was true colostrum, changing rapidly to the composition of normal milk. Plotted average lactation curves showed that peak of production was attained more slowly than normal, and at lower levels. Where the injections were continued into lactation slightly higher levels of milk production were attained. Following discontinuance of injections lactation of the 2 groups of heifers came to the same trend and continued so, apparently maintained by the mechanical stimulation of milking.

Sexual excitation unaccompanied by true ovarian function was an early effect of stilbestrol injections. This accompanied a period of ovarian quiescence, after which apparently ovulation occurred. Since the 14 heifers used in this investigation were considered mainly to be slow breeders with questionable reproductive histories,

and since 2 or 3 showed estrus later and were not bred, no conclusions should be drawn from this work as to the effect on reproduction. One of the slow breeders was pregnant when slaughtered.

BERTHELON, M., & TOURNUT, J. (1948.) **Avortements provoqués par les oestrogènes. [Abortion provoked by oestrogens.]**—*Rev. Méd. vét., Lyon et Toulouse*. **99**. 49-67. 1473

The authors review the literature concerning the abortifacient action of oestrogens. They conclude that there is now clear evidence of this action in pregnant animals, although the effects vary with the species and with the age of the foetus at the time when oestrogen is administered to the dam. The results of administering oestrogens to the pregnant cow are erratic, but abortions have been recorded at various times during gestation. In the mare, abortion has occurred after oestrogen administration at the second and sixth months. In the bitch, oestrogens cause abortion only if given during the first 18 days of pregnancy and in the cat during the first 16. Abortion occurs any time during pregnancy in the rabbit and g. pig after administering oestrogens. The rat and mouse will abort only during the first third or first half of pregnancy.

The mode of action of the oestrogen is uncertain. It is unlikely to be connected with the functioning of the corpus luteum, since in the bitch and cat that organ is necessary for the maintenance of pregnancy up to the 36th and 49th day respectively. It may act in the early stages of pregnancy by preventing proper proliferation of the endometrium and implantation of the ovum.—ALFRED T. COWIE.

THIÉRY, J. (1949.) **Examen des juments en vue de la recherche des causes de stérilité. [Examination of mares for diagnosis of sterility.]**—*Rec. Méd. vét.* **125**. 350-365. 1474

This is a detailed description of the diagnostic technique to be used in attempting to establish the cause of infertility in mares. The English thoroughbred was chosen as the representative type, since it is said to present the clinician with greater difficulties than any other breed.

Thorough history-taking is the first essential. Badly balanced feeding and affections of the gastro-intestinal tract should not be overlooked. The state of the sympathetic nervous system and its effect on ovarian function is described.

Chapters on the preparation of the animal for examination are followed by systematic treatment of the examination of the vulva, vagina (including pH), uterine cervix (visual and manual), uterus, ovaries and fallopian tubes, all in both their normal and pathological states.

The functional state of the genital tract can



be judged by observing the morphology of the various components as an expression of hormone secretion, whether normal or abnormal, and by an assay of hormones in blood and urine; but, in the present state of knowledge, the functional examination remains the weakest link in this diagnostic procedure.—G. P. MARSHALL.

SCHULLER, J. (1947.) Die Sexocretinbehandlung bei sterilen Stuten ohne katarrhalische Erkrankung des Geschlechtsapparates. [*Sexocretin treatment of sterile mares.*]—*Inaug. Diss., Vienna.* [Abst. from abst. in *Wien. tierärztl. Mschr.* 36. 44. (1949).] 1475

Thirty-four mares, aged 4–17 years, were treated for sterility caused by subfunction, hypersecretion, hypoplasia or sclerosis of the ovaries and six mares with sterility of unknown cause with subcutaneous and intravenous injections of 5–20 ml. of "sexocretin".

Of the 40 treated mares oestrus was observed in 28 after 3–6 days, in eight after 6–9 days; the remaining four did not respond. The visible signs of oestrus were not in all cases confirmed by rectal examination. In the mares which came into oestrus after 6–9 days ripening of the graafian follicles was observed; twenty-two became pregnant after service. S. states that "sexocretin" stimulates the ripening of the follicles by causing hyperaemia of the genital apparatus and that it exerts a favourable influence on minor uterine disorders.—E. G.

HANCOCK, J. L., & ROLLINSON, D. H. L. (1949.) A seminal defect associated with sterility of Guernsey bulls.—*Vet. Rec.* 61. 742–743. 1476

In an examination of samples from 463 bulls, including 89 Guernseys, the semen of 12 young Guernsey bulls, which had a history of total sterility, was found to contain free heads and tails, with a virtual absence of intact spermatozoa, the latter never being present in a proportion greater than 5% in stained smears. This abnormality was seen even in diluted semen immediately after collection. In stained smears, the sperm heads were normal in appearance, except for a small number which had a deeply-staining body at the neck, but a high proportion of separated tails were abnormal, with a characteristic thickening of the anterior extremity of the midpiece, associated with varying degrees of coiling of the midpiece and tail proper.

There was as yet no conclusive evidence that the defect was an inherited one, but from this and other observations the condition appeared to be breed specific.—E. COTCHIN.

HANCOCK, J. L. (1948.) The clinical analysis of reproductive failure in cattle.—*Vet. Rec.* 60. 513–517. 1477

This paper is based on observations made over a two-year period on a "normal" herd of 45 animals and also on 44 animals which had failed to breed.

The clinical findings were classified on the basis of ovarian activity and compared with the findings of other workers on similar material. It is suggested that chronic endometritis as a pathological entity is relatively infrequent and that the condition usually so designated is probably connected with failure of some aspect of ovarian activity. Uterine irrigations probably exert a gonadotrophic effect by distension of the uterus and bland fluids may prove as effective as the irritant ones usually employed.—E. J. H. FORD.

KOCH, P., & FISCHER, H. (1949.) Ueber die Nachzucht eines in der körperlichen Entwicklung stark zurückgebliebenen Bullen. [*The progeny of an underdeveloped bull.*]—*Berl. Münch. tierärztl. Wschr.* No. 7. pp. 85–87. No. 12. pp. 179–181. 1478

The authors report on the progeny of an underdeveloped dwarfed bull (of good ancestry imported from Friesland). At the age of two years the bull had reached only the height of a calf eight months old, but was very broad, heavily built and with short legs. Sixty-nine of the progeny were traced and examined and 32 had similar defects. The ancestry of the dams, as far as traceable, appeared to have been normal. In one calf there was spastic paresis and congenital stiffness in the right hind leg was observed. The leg was permanently stretched in a tonic spasm, the muscles were tense. There were no signs of inflammation or luxation of the patella. Sensitivity of the limb was normal. At the age of four months there were signs of incipient muscular atrophy.

Another calf was described as a "dachshund calf" with very short bow legs. This calf died eight days after birth. The dam's ancestry could not be traced.—E. G.

BERGE, S. (1949.) Inheritance of dun, brown and brindle colour in cattle.—*Heredity.* 3. 195–204. 1479

Since dun, brown and brindle colours are relatively frequent in Norwegian cattle, B. was able to investigate their genetics more closely.

Dun colour, which occurs in Norwegian West Coast cattle, in a light and a dark variety, is characterized by an *agouti* pattern, i.e., light and dark zones, in the hair. The tendency of its distribution between the sexes is the same as for red and brown. It is caused by a dominant factor *D* which acts only when the factor for black is present and evidently has no influence on the red colour.

The result of back-cross of dun *F*<sub>1</sub> cows to red bulls was: 13 dun; 9 black; 25 red.

Light dun was caused by a special recessive dilution factor acting on dun and red, but not on black.

Brown colour, which is common in "Dølefe", an important breed in some Norwegian highland districts, and is probably the same as the "donn" colour of West Highland cattle, gives a darker shade in males than in females. It is caused by a factor,  $B_s$ , dominant to red and recessive to black.

The result of back-cross of brown  $F_1$  animals to red was: 7 brindle; 30 brown; 30 red. (Some of the reds had evidently carried the brindle factor, which is hypostatic to red.)

Brindle colour is determined by a factor  $B_r$ , which acts only on  $B_s$  (brown). By back-crossing brindle  $F_1$  animals to red, the following results were obtained: 23 brindle; 14 brown; 62 red.

The nature of the colourings studied is illustrated by a number of photographs, some of which are in colour.—G. P. MARSHALL.

CELLA, F. (1948.) Microftalmia cistica congenita in una nidiata di otto suini. [Congenital microphthalmia cystica in a litter of eight piglets.]—*Nuova Vet.* 24. 145–150. 1480

This is a report of bilateral microphthalmia cystica in an entire litter of otherwise normal piglets. (Two previous litters from the same sow and boar had normal eyes.) Histological sections revealed rudimentary traces of the retina, choroid, ciliary body and crystalline lens. In a discussion of the possible cause of the affection C. suggested that the sow may have developed some infection, possibly influenza, when it was vaccinated against erysipelas and swine fever about half-way through the pregnancy. This may have caused an inflammation of, or had a toxic action on, the developing eyes of the foetuses, resulting in cystic degeneration with consequent microphthalmia.—I. W. J.

GRAHAM, J. B., BUCKWALTER, J. A., HARTLEY, L. J., & BRINKHOUS, K. M. (1949.) Canine hemophilia. Observations on the course, the clotting anomaly, and the effect of blood transfusions.—*J. exp. Med.* 90. 97–111. [Authors' summary copied *verbatim*.] 1481

A study was made of the clotting defect and the course of the malady in a group of male dogs with an inherited, sex-linked bleeding disease. The clotting defect is characterized by a prolonged clotting time and a delayed prothrombin utilization, and is corrected by the addition either of thromboplastin or of normal plasma. A plasma protein fraction, fraction I, also corrects the defect. The defect appears to be due to a deficiency of a plasma factor, which normally, in the presence of platelets, makes thromboplastin available in shed blood. The clotting anomaly appears to be identical with that found in human hemophilia.

The hemostatic defect is characterized by repeated hemorrhages, usually without obvious relationship to trauma. Hemarthroses occur frequently and may result in permanent joint deformity. The animals usually die early in life from massive hemorrhage.

Transfusions with normal blood or plasma correct the clotting defect and readily control the hemorrhagic phenomena. By the use of transfusions, these dogs have been reared to maturity.

NIEDERMEIER, R. P., & SMITH, V. R. (1950.)

Parturient paresis. IV. The effect of udder inflation upon blood levels of calcium, magnesium and phosphorus in cows with parturient paresis.—*J. Dairy Sci.* 33. 38–42. [Authors' summary copied *verbatim*.] 1482

Data are given for the blood levels of calcium, magnesium and phosphorus during the recovery period for seven cases of parturient paresis in Jersey cows which were treated by udder inflation.

BLOSSER, T. H., & SMITH, V. R. (1950.) Parturient paresis. V. Blood serum levels of citric acid and calcium in normal parturient cows and cows with parturient paresis.—*J. Dairy Sci.* 33. 81–86. [Authors' summary copied *verbatim*.] 1483

Blood serum citric acid and calcium analyses were run on twenty-two Jersey, six Guernsey and four Holstein cows from 10 days prepartum to 10 days postpartum. There were no significant differences in blood serum citric acid between breeds or between prepartum- and non-prepartum-milked cows. There was a highly significant correlation between blood serum citric acid and calcium over this period of time. Serum citric acid levels did not show any appreciable change between 8 and 1 days prepartum, but there was a definite drop in both milk fever and normally calving cows between 1 day prepartum and 1 day postpartum. This drop was of greater magnitude in milk fever than in normal cows.

Following parturition, serum citric acid levels increased in normally calving cows and decreased in cows which developed milk fever. Part of this difference in behaviour can be attributed to relapses which occurred in several of the cows with milk fever.

MOULE, G. R., & JACKSON, M. N. S. (1949.) Lambing losses.—*Qd. agric. J.* 69. 235–249. 1484

In a survey of the extent and nature of losses of lambs between birth and marking the majority of graziers considered their losses varied in the average year between 5% and 12% of lambs born. The causes of mortality may be classified into those affecting both ewe and lamb and those affecting the lamb only. The greatest loss of



lambs occurs within three days of birth and causes of such loss include starvation, resulting either from failure to find the teat or from inability to remove a tight plug of detritus in the teat canal, extreme weather conditions, navel infections, copper deficiency and predators. Ill health, poverty and mismanagement may cause the ewes to leave their lambs. Fly strike can be an important factor in this regard. In one trial in which 12% of new-born lambs died the chief causes of loss in order of importance were: lambs unable to drink because of plugged teats, weak and/or premature lambs, cold, lambs forsaken by the ewe or death of the ewe, attacks by crows, and lambs strangled at birth as a result of difficult parturition.

—J. F. BARRETT.

THOMAS, I. M. (1949.) **A sex-intergrade sheep.**  
—*Aust. vet. J.* 25. 294–297. 1485

See also absts. 1296 (immune globulins in pre-colostrum); 1299–1300 (icterus in foals); 1368 (vitamin A deficiency); 1373 (vitamin E); 1384 (vaginal catarrh); 1437–1438 (hormones); 1533–1534 (books, sex hormones).

## ZOOTECHNY

HENSON, R. (1949.) **Two methods of dehorning calves.**—*Agriculture, Lond.* 55. 444–446. 1486

Calves may be dehorned by the application to the horn bud of a solution of antimony trichloride in collodion with a small brush after a preliminary cleansing of the area. Six calves treated when over ten days old developed horn growth, whereas five calves treated before the tenth day developed no growth and one six-day-old calf treated without previous cleansing developed slight growth. Alternatively, an electrically heated iron may be applied to the horn bud to produce a ring of seared tissue. Four calves treated before the 21st day developed no growth whilst two treated later in life grew horns. It is concluded that the chemical method should be applied before a calf is nine days old, the electrical method before 21 days.

MISNER, E. G. (1944.) **Four methods of estimating the weight of a dairy cow.** pp. 8. Cornell Univ., N.Y.: Dep. agric. Econ. 1487

These include:—(1) the measuring of heart girth, (2) an index of size calculated from height, width of hip and length of rump, (3) the sum of body, heart and neck girths cubed and multiplied by a factor, plus a constant, (4) body volume calculated from heart and body girths, and the length from shoulder point to pin bone, using the formula for the frustrum of a cone.

Method (4) seems to be the most accurate, giving a mean error of  $\pm 3.47\%$ ; method (2) is the least accurate, giving a mean error of  $\pm 7.35\%$ . The heart girth method is the simplest, giving an error of  $\pm 5\%$ . The errors indicate no significant

The genital organs of a hermaphroditic sheep found at an Adelaide abattoir are described. Diagrams of the organs are included and some histological features, as well as details of the macroscopic appearance, are reported. Outstanding features were the presence of two testes, one large and anatomically normal, the other smaller and incompletely descended, together with a large uterus distended with fluid. The individual was regarded as a genotypic male which had been partially feminized at an early stage of development.

The rarity of recorded examples of such sex-intergrades in sheep may be due in part to the slaughter policy often adopted on sheep properties and to the late stage at which carcasses are viewed by veterinary meat inspectors under the "chain system" of slaughter used for sheep.—A. A. D.

deviations from the errors of random sampling.  
—ALAN G. WARREN.

BOUÉ A. (1949.) **Essai de barymétrie chez le dromadaire nord-africain. Zootechnical measurements in the North African dromedary.**  
—*Rev. Elev. Méd. vét. Pays trop.* 3. 13–16. 1488

Although the digestive tract of the camel is very similar to that of the ox, its physiology is more specialized in that it is liable to greater variations in its contents than is ever met with in the ox. These variations are due to fasting, lack of water and to the very great differences in the types of browsing available as well as to faulty management in some cases. Thus, after a fast of 48 hours, a camel may take in on the third day 120–150 kg. of green fodder. After three days without water, it may take 40 l. of water and one authority in 1858 puts it as high as 104 l.

Two different weights can therefore be registered for the same camel—the nett weight or true anatomical weight and the gross weight. Complicated tables are given to illustrate how the approximate weight can be estimated from certain definite measurements. To obtain the nett weight, the following formula is used:—thoracic girth (T)  $\times$  abdominal girth (A)  $\times$  height (H)  $\times 53$ —or  $W = 53TAH$ .

To obtain the gross weight, the estimated weight of alimentary mass is added to the nett weight. With a little practice this mass can be approximately estimated and is usually taken as about 40 kg. The final table in the paper shows the actual weight of the camels as scaled, the estimated nett weight (by measurement) plus 40 kg.

and the last column gives the actual error or the difference between true weight and estimated weight, which varies from 0.39 kg. to one exceeding 25 kg.—D. S. RABAGLIATI.

RICHES, J. H., & JOHNSTONE, I. L. (1949.) **An experiment to determine the relative growth and productivity of rams and wethers under identical field conditions.**—*Aust. vet. J.* 25. 270-272. 1489

The growth rate and wool production of rams and wethers of similar breeding were compared under identical conditions.

A group of 90 male lambs, of approximately

See also abst. 1538 (book, veterinary science).

## TECHNIQUE AND APPARATUS

SILVERSTOLPE, L. (1948.) **Förbättrad metod för påvisande av tuberkelbakterier. [Improved method for demonstrating tubercle bacilli.]**—*Nord. Med.* 40. 2220-2222. [Abst. in *Bull. Hyg., Lond.* 24. 278. (1949), copied *verbatim*. Signed: D. J. BAUER.] 1490

In experimental work on renal tuberculosis in animals it was noted that tubercle bacilli accumulated at the surface of urine when it was allowed to stand, and this observation was made the basis of a concentration method. In preliminary experiments it was found that the specific gravity of tubercle bacilli varied from 1.07 to 0.79, with a mean of just below 1.0, the value depending upon the fat content and the medium upon which the bacilli had grown. The organisms were concentrated by centrifuging in a special tube. This had a narrowed neck to reduce the area of the upper layer of liquid containing the separated bacilli; the lower end was closed with a rubber stopper having a depression in which the heavier organisms accumulated and by means of which they could be removed without admixture with supernatant fluid. The procedure finally adopted for concentrating tubercle bacilli from urine was as follows:—four parts of urine were mixed with one part of 68 per cent sucrose solution and allowed to stand for three hours in a tilted position in a conical flask which was nearly full; 4 cc. were then removed from the top and bottom layers and put into a special centrifuge tube. Into another tube were put 2 cc. from each layer and 2 cc. of 12.5 per cent. sulphuric acid; after 15 minutes the mixture was neutralized with 10 per cent. sodium hydroxide in a volume of 2 cc. Both tubes were then centrifuged. The upper and lower layers were removed and used for staining, culture and guinea pig inoculation. Sputum or stomach washings were treated similarly. A sample of up to 10 cc. was taken and 20 gm. of

uniform size and about five weeks old, were selected from a much larger group. These were then divided at random into three groups. The lambs in one group were castrated at five weeks of age, in the second group they were castrated at four months of age and in the remaining group they were left entire.

During the three years of observation the rams reached considerably greater body weights and cut 12.4% more greasy wool than the wethers. There was no difference between the two castrated groups. Horn growth was, however, appreciably greater in the wethers castrated at four months than in those castrated at five weeks.—D. F. S.

sucrose were added. Warm water was added so as to fill completely a 150 cc. conical flask; a clear solution was obtained, free from mucus. The flask was placed in a tilted position for three hours to allow concentration to occur, and further treatment was carried out as with urine. Exudates and ascitic fluids were treated similarly, and cerebrospinal fluid was centrifuged directly without preliminary concentration. Figures are given to show the greater frequency of demonstration of tubercle bacilli by these as compared with the routine methods.

WENTZEL, L. M., & STERNE, M. (1949.) **A simple double-surface dialyzing membrane.**—*Science.* 110. 259. 1491

A double walled flexible seamless tube was formed by pulling the end of a cellulose sausage casing back through the casing tube. Bacteria of *Clostridium botulinum* type D when inoculated into the annular space between the walls were found to be effectively confined, even at high concentration.

The apparatus, illustrated by diagrams, could also be used for dialysis, the liquid to be dialysed being placed within the annular space. As the top is left open and as the membrane is flexible, the levels of the liquid inside and outside the membrane always remain the same. Variation in the amounts of liquid inside and outside the bag altered the dialysing surface at will.—D. E. D.

SUTER, R. (1948.) **Action des "produits mouillants" sur la coloration des parasites sanguicoles. [Action of wetting agents on staining of haematozoa.]**—*Ann. Parasit. hum. comp.* 23. 220-221. 1492

Simons (1947) used thedan blue, containing methylene blue and saponin, to stain protozoan parasites in blood. Replacing the saponin by other, strongly haemolytic wetting agents, Suter



obtained staining as brilliant as with the dan blue, although haemolysis was not so complete.

—L. M. MARKSON.

BAKER, J. R., KEMPSON, D. A., & BRUNET, P. C. J. (1949.) A simple method for phase-contrast microscopy: improvements in technique.—*Quart. J. micr. Sci.* 90. 323–329. [Authors' summary copied *verbatim*.] 1493

The following are the main improvements that we have made in the method of phase-contrast microscopy described by Kempson, Thomas, and Baker (1948): No bull's eye condenser is used. The illuminant is an electric bulb with a 'porcelain-processed', 'flashed white', or 'opal' surface. No oiled paper is placed over the illuminating annulus. The thickness of the deposit of magnesium fluoride on the phase-plate is controlled by observations on the interference colours given by surface reflections. Positive (dark) phase-contrast is preferred for most purposes to negative (bright).

HILLIER, J. (1949.) Some remarks on the image contrast in electron microscopy and the two-component objective.—*J. Bact.* 57. 313–317. 1494

In the electron microscope contrast as well as resolving power is determined entirely by the numerical aperture (N.A.) of the objective. With a large physical aperture (N.A. = 0.3) spherical aberration is a serious problem. With a small aperture ( $50\mu$ ; N.A. = 0.01) resolving power is reduced. Spherical aberration can be used as a means of obtaining greater resolution, but contrast, except of edges of objects, is lost by dissipation of electrons. H. designed a new lens consisting of two components: the first has a focal length of about 11 mm. and is situated 22 mm. from the specimen; the second is a short focal length lens similar to the conventional electron microscope objective. Apertures of  $50\mu$  are still used, but they result in numerical apertures ten times smaller than with the same aperture in a conventional lens. Very great contrast is obtained with this system, but there is an appreciable reduction in the resolving power (60–80A).

—L. M. MARKSON.

NYGAARD, G. (1949.) A simple micromanipulator.—*Science*. 110. 165–166. 1495

This is essentially a clamp, one end of which is fixed to the microscope objective, the other being designed to hold a pipette, the point of which can be focussed in the field of vision. If it is desired to pick up a particular cell, the stage is moved until the cell is at the mouth of the pipette, when it can be sucked in. An air-tight screw device on the proximal end of the pipette controls the suction.—L. M. MARKSON.

DELAMATER, E. D., & ULRICH, D. (1948.) Basic

fuchsin as a nuclear stain.—*Stain Tech.* 23. 161–176. [Authors' abst. copied *verbatim*.] 1496

Five distinct nuclear stains and staining procedures which utilize basic fuchsin as the dye have been studied, compared and tested on a Feulgen-weak fungus, *Blastomyces dermatitidis*, and other fungi.

Aqueous basic fuchsin has been shown to be an excellent, though impermanent, stain with which to study the nuclei of this and other fungi. The conditions under which formaldehyde acts as a mordant for basic fuchsin and produces a permanent nuclear stain have been established.

Comparison of crystal violet and basic fuchsin suggests that the mordanting action of the aldehyde operates through the para-amino groups of the dye. Certain other basic dyes were not mordanted by formaldehyde.

Gentle acid hydrolysis of the tissues has been found to be essential both to the specificity of the dye as a nuclear stain and to the mordanting effect of the aldehyde.

The possible relationship of these observations to the Feulgen reaction is discussed. A protocol for the method developed is presented. DOXTADER, E. K. (1948.) Isopropyl alcohol in the paraffin infiltration technic.—*Stain Tech.* 23. 1–2. [Author's abst. copied *verbatim*.] 1497

A method is described for using isopropyl alcohol for dehydration of animal tissues preceding melted paraffin infiltration. Advantages of the technic are: simplicity, low cost, low toxicity, and diminished distortion and hardening of the tissues.

RICHARDSON, A. W., RANDALL, J. E., & HINES, H. M. (1949.) A newly developed electromagnetic flow meter.—*J. Lab. clin. Med.* 34. 1706–1713. [Authors' summary copied *verbatim*.] 1498

A new electromagnetic blood flow meter has been developed which produces a continuous permanent record of mean blood flow. This device is adaptable to measure pulsatile blood flow in the respect that it readily records the effect of the heart rhythm and respiration upon blood flow. Modifications are suggested for recording events of shorter duration. The use of this meter entails the disadvantages inherent with cannulation, but such disadvantages must be weighed against the advantages of accuracy, stability, and ease of operation. The stability and accuracy of this meter is in a large measure dependent upon careful construction of the cannula and pickup leads.

KULKA, W. (1949.) A practical device for demonstrating air embolism.—*Arch. Path.* 48. 366–369. [Author's summary copied *verbatim*.] 1499

A new device is presented to demonstrate the presence of air embolism, pneumothorax and like

conditions. This device may also be used to trap gases for identification and analysis in cases of poisoning by volatile solvents and gases and might materially aid in the diagnosis of caisson disease. Five cases investigated recently are cited to illustrate the value of the device.

PACKCHANIAN, A. A. (1949.) **The production of antirabbit hemolysin.**—*J. Lab. clin. Med.* 34. 1692-1695. [Author's summary copied *verbatim*.] 1500

Antirabbit hemolysin was produced in sheep by inoculating them intravenously and subcutaneously with washed rabbit red blood corpuscles. The hemolysin titer acquired by these animals ranged from 1:10 to as high as 1:320.

Hemolyzed erythrocytes and stroma injected into sheep for the production of hemolysin did not produce as high a titer as washed erythrocytes.

Antirabbit hemolysin and 2 per cent washed rabbit erythrocytes were used in testing syphilitic and normal sera by modified Kolmer-Wassermann technique. The results obtained in every instance were clear-cut and of diagnostic value.

MACKLIN, C. C. (1949.) **The two types of epithelium of the finest bronchioles of the albino mouse as revealed by supravital silverization.**—*Canad. J. Res. Sect. D.* 27. 50-58. 1501

Using special technique which is described, two types of cells of the epithelium of the finest bronchioles, light and dark, were observed. The dark cells were ciliated and were scattered among the light unciliated cells. Similar observations were made in similar material from nine other mammals.—R. GWATKIN.

SHUEY, H. E., & CEBEL, J. (1949.) **Standards of performance in clinical laboratory diagnosis.**—*Bull. U.S. Army med. Dep.* 9. 799-815. [Abst. from authors' summary copied *verbatim*.] 1502

A technical proficiency survey was conducted in the first ten months of 1948 to determine the accuracy of performance of clinical laboratory procedures and milk analysis. Fifteen laboratories of Army and Air Force hospitals participated in various phases of the survey. The results showed the necessity for improvement in technical proficiency. The main reasons for inaccurate results were the use of inadequately trained personnel and lack of adequate supervision.

LAMOUNIER, R. D. (1948.) **Nova técnica para a determinação do índice icterico em bovinos. Aplicação clínica. [A technique for the determination of the icteric index in cattle. Clinical applications.]**—*Rev. Fac. Med. vet. S. Paulo.* 3. 171-180. [English summary.] 1503

The method is a test of the blood for bile

pigment and carotene. Details are given of the results in 213 animals.—G. P. MARSHALL.

RALSTON, N. P., KLEIBER, M., & SMITH, A. H. (1949.) **Venous catheterization of dairy cows.**—*J. Dairy Sci.* 32. 889-893. [Author's summary copied *verbatim*.] 1504

A technique of venous catheterization has been adapted to dairy cows, which allows numerous blood samples to be taken at short intervals and the frequent, accurate intravenous injection of substances (particularly radioactive material) over a long period with a minimum of disturbance to the animals.

DANOWSKI, T. S. (1949.) **The disappearance of glucose from incubated blood containing added electrolytes.**—*Yale J. Biol. Med.* 22. 23-30. [Author's summary copied *verbatim*.] 1505

The disappearance of glucose from defibrinated human blood during incubation may be retarded by  $\text{CaCl}_2$ ,  $\text{MgCl}_2$ , or  $\text{HCl}$ . An accelerated loss of glucose occurs in blood which contains added  $\text{NaHCO}_3$ ,  $\text{Na}_2\text{SO}_4$ ,  $\text{Na}_2\text{HPO}_4$ ,  $\text{NaOH}$ ,  $\text{NH}_4\text{Cl}$ , or  $(\text{NH}_4)_2\text{HPO}_4$ . Increments of  $\text{NaCl}$  and  $\text{KCl}$  as high as 40 mEq. per liter fail to modify the rate of glucose disappearance.

SWAN, J. B. (1947.) **Celloidin casts of the ducts and vessels of the sheep's liver.**—*N.Z. J. Sci. Tech.* 29. 91-100. 1506

A method is described for preparing and injecting the sheep's liver with solutions of cellulose acetate in acetone, and subsequent corrosion of the liver in a peptic digest, to produce permanent and durable casts of the biliary and blood vascular system of the liver. The apparatus described is simply constructed and operated, and the livers may be prepared under field conditions if so required. It is possible to take blocks of liver tissue for histological examination before preparing the liver for injection. Some preliminary results are given of the application of the technique to the study of the hepatic structural changes occurring in facial eczema in sheep.

PAGÁN, C. (1948.) **The use of guppies in the toxicological assay of *Derris* and *Lonchocarpus* roots.**—*J. econ. Ent.* 41. 942-945. [Author's summary copied *verbatim*.] 1507

A quick, simple method for biologically assaying *derris* and *lonchocarpus* roots using guppies [*Lebistes reticulatus*, a small fish] as a test animal is described. The toxicity data (rotenone equivalent) obtained with guppies was in close agreement with that obtained with houseflies. The advantages of using guppies as test animals for the toxicological assay of *derris* and *cube* roots are considerable, particularly in the simplicity and rapidity of the method.

See also absts. 1182 (cultivation of staphylococci); 1203-1204 (*M. tuberculosis* cultivation); 1205 (sputum digestants); 1207 (desiccation of mycobacteria); 1226-1228 (*Brucella* cultivation); 1246 (microscopy of F. & M. disease virus); 1410 (penicillin assay); 1427 (thermistor); 1452 (alcohol test for milk); 1462 (semen examination); 1466 (fertility determination); 1528 (book, blood staining); 1530 (textbook, cytology); 1531 (textbook, histology).



## MISCELLANEOUS

ANON. (1948.) Die erste Interzonale Veterinärkonferenz in Berlin vom 14. bis 16. Oktober 1947. [The first interzonal veterinary conference in Berlin, 14th-16th October 1947.]—*Berl. Münch. tierärztl. Wschr.* No. 2. pp. 25-27. 1508

The subjects discussed included F. & M. disease, TB., brucellosis, trichomoniasis and sterility, the control of interzonal traffic, the issue of fortnightly bulletins of disease notifications covering the whole of Germany, and arrangements for provision of drugs, instruments and motor vehicles. The Conference considered that fusion of the zones to form one single State was essential if the health of the nation and its economy were to be restored.—E. G. WHITE.

CARMICHAEL, H., & TUNNICLIFFE, P. R. (1948.) Measurement of alpha-active dust in the atmosphere.—*J. industr. Hyg.* 30. 211-227. [Abst. in *Bull. Hyg., Lond.* 23. 873. (1948), copied *verbatim*. Signed: S. RUSS.] 1509

The authors are concerned here with the problem of estimating the degree of contamination of the air in uranium, plutonium or radium laboratory operations; the actual concentration of radio-active dust, if the operating processes are carefully watched, is very low, so low indeed that the natural radioactivity of the air due to radon and thoron is on a considerably higher level.

For instance, in the case of plutonium the permissible concentration at present accepted (U.S. and Canadian Atomic Energy Projects) corresponds to an alpha ray activity of 70 disintegrations per cubic metre per minute, compared with 3,000 from radon normally present in the atmosphere. This may be taken as an indication of the present day care of the personnel.

In actual measurements this background of natural radioactivity must be allowed for or better still eliminated by storing the sample of air for 6 hours, the time required for the Ra A and B and C to decay to insignificant amounts. There are two chief ways of collecting the air samples, by filtration or by electrical precipitation. Apparatus and the working arrangements are described in some detail and the main conclusions reached about the two methods are that the precipitation method gives higher counts and more consistent results than the filter method, though the latter is less costly, simpler and less liable to breakdown.

[This is a valuable paper to consult for anyone engaged in the care of staff employed in such high-grade process work, but the medical officer in charge will gladly leave the operation of these methods of control in the hands of his physical collaborators.]

VILLEGAS, V. (1948.) The recent importation of livestock from Pakistan.—*Philipp. Agric.* 32. 79-83. 1510

In 1947 the Philippine Government imported 49 Murrah buffaloes, 165 Red Sindi cattle and 120 Tharparkar cattle from Pakistan for improvement of the local breeds. In this article details of the cost of the shipment are given which will be of interest to others who may be contemplating similar purchases. The total cost was 242,943 Philippine dollars. The purchase price of the animals accounted for 48.7% of the total, freight for 29.2%, feeding expenses for 10.9%.

Shipment was from Karachi. It should be noted that these breeds, namely Sindis, Tharparkars and Murrah buffaloes, usually referred to as Indian breeds, are now obtainable not in India but in Pakistan.—M. C.

VON SKRAMLIK, E. (1949.) Über die Auffassungsgabe und Lernfähigkeit von Katzen. [The power of comprehension and learning ability of cats.]—*Mh. Vet.-med.* 4. 195-199. 1511

Von S. gives examples which illustrate the ability of cats to learn by watching the actions of their owners. Opening doors, sitting up at table and eating from a dish, urinating (but never defaecating) in the water closet, "shaking hands" with the tail (never with the paw), playing catch-ball, and developing the most effective method of climbing up and down from a high verandah into the garden below—these examples show how readily cats learn from their owners and devise methods for their own enjoyment and advantage. They cannot be trained as dogs are trained, for they will not surrender their will to that of their owner: they cannot be hypnotized. They do nothing because it pleases their owner; but they display surprising ingenuity when it pleases them.

—E. G. WHITE.

TREADGOLD, S. (1949.) The scope of the medical illustrator.—*Lancet.* 256. 701-704. 1512

Drawings have many advantages over photographs: they may be composite; emphasis may be gained by distortion; inessentials may be omitted. Thus, despite the advent of photography T. claims that there is still a place for the medical illustrator, especially in modern teaching hospitals, and pleads for a recognized course of study. The production of displays, exhibitions, graphs, wall charts, etc., all come within the scope of his work. There follows a brief account of line drawing, half tone reproduction and colour reproduction, and reference is made to cinematograph films, film strips, lantern slides and moulage [casting or moulding in wax].—L. M. MARKSON.

## REPORTS

**INDIA, UNITED PROVINCES. (1946.) Annual Administration Report of the Animal Husbandry Department for the year ending 31st March, 1945.** pp. 49. Allahabad: Supt. Printing & Stationary. [8vo.] [9 annas.] 1513

The staff consisted of four class I officers besides the Director and the Director of Veterinary Services, ten class II and 554 subordinate officers. The total expenditure of the department was Rs. 1,194,718 as against Rs. 826,886 in the previous year. The Animal Husbandry Department was created in January 1944 under the Directorship of Mr. F. Ware, retired Animal Husbandry Commissioner with the Government of India. With the formation of this department everything connected with livestock improvement including poultry and fisheries, which in the past was done partly by the Veterinary and partly by the Agricultural departments, was brought under the Animal Husbandry Department and all operations connected with the breeding of cattle, sheep, goats, pigs, horses, poultry, cattle census and marketing of livestock and other animal products such as milk, ghee, eggs, fish, etc., were carried out by this department.

The report is divided into several chapters such as administration, disease control, research, breeding, marketing, fisheries, etc., giving the departmental activities in detail and contains 15 tables giving details of deaths from contagious diseases, preventive inoculations, castrations, animals treated, breeding results, animals slaughtered.

As usual, deaths from RINDERPEST were the highest, being 8,105 as against 6,245 the previous year and there were more deaths among buffaloes than among cattle. In all 162,005 animals were inoculated against RINDERPEST, compared with 108,082 the previous year. Details of inoculation against contagious diseases are tabulated.

Desiccated goat spleen vaccine was used in four districts, both in outbreaks and as a prophylactic with good results. Experiments were in progress for making the desiccated vaccine in pillule form. Animals injected with desiccated vaccine were tested for immunity after 29 months and those injected with pillule vaccine after six months, and in both the immunity conferred was solid. During the year 173,600 doses of goat tissue virus, 53,100 doses of goat tissue macerated vaccine, 3,600 doses of dessicated vaccine and 399,610 doses of HAEMORRHAGIC SEPTICAEMIA vaccine were issued for use in the field from the Biological Products Section, Lucknow.

Experiments on the feeding values of barley, maize, Indian and pearl millet for growth of

Hariana and Murrah bull calves were included. The results indicate that barley and pearl millet are superior to maize and Indian millet.

Milk recording was conducted in two districts, 191 cows and 201 buffaloes being selected for the purpose.—M. K. SREENIVASAN.

**NYASALAND PROTECTORATE. (1948.) Annual Report of the Veterinary Department for the year ended 31st December 1947.** [GRAY, W. J.] pp. 3. Zomba: Govt. Printers. 1514

The Department had two vacancies for Veterinary Officers and its activities were restricted owing to staff shortage. One V.O. arrived on first appointment during the year.

BLACKLEG is enzootic in Lilongwe District, but no cases were reported. Extensive vaccinations were carried out in previous years; only 99 head of cattle were vaccinated in 1947.

A few cases of REDWATER were reported.

FOWL TYPHOID and COCCIDIOSIS of poultry accounted for many deaths.

There were five outbreaks of TRYPA-NOSOMIASIS in the Blantyre District and one each in the Namweras and Luchenza areas. In the Karonga District there were fewer outbreaks than in 1946 and these mainly in tsetse infested areas. Sporadic outbreaks were reported in the Mzimba District and in Dowa District the disease remained endemic. Phenanthridinium compound 1558 is stated to be giving satisfactory results.

Two hundred and four cases of EAST COAST FEVER were reported in the Central Province and eight in the Northern Province. "Seven day dipping" is enforced. An experimental use of 0.5% gammexane "in conjunction with" the usual arsenical dip fluid is being made.

Of 39 brains examined for RABIES, 11 were positive. Facilities for examining suspected cases is inadequate.

One animal vaccinated against AFRICAN HORSE SICKNESS died with "dikkop" symptoms.

The construction of puddle core dams in Karonga District has been continued to provide water for cattle in waterless dry season areas and so avoid the movement of cattle from the village areas.

Animal products marketed included 33,700 lb. of clarified butter (ghee). 4,376 cattle, 5,274 sheep and goats and 1,279 pigs were slaughtered at abattoirs and markets.

Slaughter animals sent to the Southern Provinces from Dedza and Ncheu included 3,014 cattle and 2,219 sheep and goats.

Nyasaland hides and skins are exported to South Africa and African ex-soldiers are being



trained in tanning and cobbling at Lilongwe.

—J. A. GRIFFITHS.

DENMARK. (1947.) Aarsberetning fra Veterinaer-direktoratet for Aaret 1945. [Annual report of the Veterinary Directorate, Denmark, 1945.] [NIELSEN, F. W.] pp. 183. Copenhagen: Universitet - Bogtrykkeri. [French summary.] 1515

The introduction outlines the scope and organisation of the Veterinary Directorate and gives the names of the principal officials. During the year the meat inspection division was expanded so as to give a full country-wide service.

There were 4 outbreaks of ANTHRAX, 7 of EQUINE PNEUMONIA, 74 of F. & M. DISEASE, 7 of EQUINE ENCEPHALOMYELITIS, 4 of BOVINE ENZOOTIC MENINGITIS, and 3 of EQUINE MANGE: the above are reckoned as important diseases. The incidence of less important diseases is tabulated under 19 headings and extracts from reports of district veterinarians about them are given. The usual records about BOVINE TB. control work appear: 88% of tuberculin tested herds were free from infection. Much diagnostic work was done on BOVINE BRUCELLOSIS and 55,000 cattle were vaccinated with live culture.

Livestock census figures were:—609,000 horses, 3,188,000 cattle, 2,084,000 pigs, 202,620 sheep and 16.8 million fowls. Figures are also given about livestock imported, exported and slaughtered in the state establishments. The usual meat and milk control statistics are given.

Half the report consists of copies of the numerous laws, regulations and circulars issued by the directorate in 1944.—J. E.

DENMARK. (1948.) Aarsberetning fra Veterinaer-direktoratet for Aaret 1946. [Annual report of the Veterinary Directorate, Denmark, 1946.] [NIELSEN, F. W.] pp. 147. Copenhagen: Universitet - Bogtrykkeri. [French summary.] 1516

There was only one outbreak of ANTHRAX. Data of diagnostic work reflect the decreasing importance of BOVINE TB. More cases of TB. in pigs than in cattle were detected by tissue examination. Out of 194,700 herds tuberculin-tested, 94.5% were free from infection. Large-scale work for the control of BOVINE BRUCELLOSIS was continued and 64,000 cattle were vaccinated. There were 18 cases of EQUINE PNEUMONIA.

F. & M. DISEASE appeared on 400 farms involving sheep and pigs in addition to cattle. Vaccination against it was carried out in half the country. Virus types O and A were both present. There were eight cases of EQUINE ENCEPHALOMYELITIS, 19 of bovine enzootic meningitis and over 11,000 cases of virus distemper in fur-bearing

animals, chiefly mink. There were also eight cases of EQUINE MANGE. The incidence of the so-designated milder infectious diseases is tabulated, and poultry diseases are similarly dealt with.

The figures obtained in a livestock census were: 624,000 horses, 3,167,000 cattle, 1,766,000 pigs, 170,000 sheep and close on 18 million poultry. The usual statistical information is given about meat and milk inspection.—J. E.

NIŽNÁNSKY, F. (1949.) Zpráva o činnosti Štátného diagnostického veterinárneho ústavu v Bratislave za rok 1948. [Annual report of the government institute for veterinary diagnosis in Bratislava for the year 1948.]—Čas. československ. Vet. 4. 375-376. 1517

During the year 1948 diagnostic examination of 16,692 cases of notifiable infections, 330 of other infections, 143 of general diseases, 168 of parasitic diseases and 12 of poisoning was carried out by the institute. These figures include diseases of domestic animals, poultry and game.—E. G.

U.S.A. (1949.) Department of Agriculture. Report on the Agricultural Experiment Stations, 1948. pp. 157. [Items of veterinary interest pp. 111-116.] Washington, D.C.: U.S. Vogt. Printing Off. 8vo. 35 cents. 1518

The greater part of the section of this report which deals with matters of veterinary interest, refers to work done on NEWCASTLE DISEASE of poultry and is a general discussion on the vaccines already elaborated and tried out. In 1945, the Californian Station used a formolized vaccine, injected intraperitoneally, with some success. Among other methods mentioned in the report, the Massachusetts Station in 1947 tried a low-virulence vaccine by the stick method (needles carrying a drop of vaccine) on sexually immature birds without producing an outbreak of the disease. It transpires that cats are able to spread NEWCASTLE DISEASE in their faeces, but probably any animal eating diseased birds would do the same. The Minnesota Station found a new symptom of the disease, i.e., the coughing of blood which was observed in a few outbreaks in adult birds—a symptom also met with in laryngotracheitis. Finally, the conclusion is arrived at that the study of NEWCASTLE DISEASE has not as yet been completed with the advent of preventive vaccination, but rather the work has only just begun.

A short account is given of the work carried out on INFECTIOUS SINUSITIS OF TURKEYS from which the economic loss to producers may be high.

In discussing MASTITIS and its treatment in cattle, it is reported that cows raised in Eastern Washington are 4-5 times as apt to be infected

with staphylococcal as with streptococcal mastitis. This is not true for Western Washington. Results show that the majority of these staphylococci possess the characteristics of pathogenic forms and also produce a toxin which might cause "food poisoning". This fact must be considered in any future mastitis control work.

In connexion with BRUCELLOSIS in cattle, the University of California reports that after taking measurements of the density of the organisms in the air in stockyards, it was found that they were in sufficient concentration to cause infection in those breathing it. At Michigan a new vaccine has been prepared from the swine strain of the organism and, although still in its experimental stage, it is claimed that it has the following advantages over the old strain 19 vaccine:—(1) its reaction in calves does not put them off their feed, (2) lactating cows do not have a fall in milk production after its use, (3) the attendant positive reaction following vaccination seldom lasts longer than 100 days either in young or adult cattle—and (4) it can be used on pregnant cows without danger.

A new disease in cattle is reported from New York, first noticed in 1941 and called "X-DISEASE" (hyperkeratosis or proliferative stomatitis). Up to now little or nothing is known as to its cause, but it is looked upon as a serious complaint.—D. S. RABAGLIATI.

—, (1948.) **Report of the FAO Mission for Siam.** pp. vii + 129. Washington: Food & Agriculture Organization of the United Nations. 1519

The problem of RINDERPEST control was investigated and handled by H. S. Purchase of the British Colonial Veterinary Service. Cattle and buffaloes are at present essential for carrying on cultivation of the small fields used for rice growing. The loss of a work animal is a serious matter for the small farmer. There appears to be a good prospect of completely controlling RINDERPEST by the use of goat virus for cattle and avianized virus and lapinized virus for buffaloes. It is recommended that the production of the biological products required should be transferred from

Bangkok to Pakchong and that additional equipment, laboratories and land be provided. There are in Siam a number of well trained veterinary officers who could prepare and use the various biological products. There is, however, need for an experienced veterinary pathologist to supervise preparation and use of the biological products new to Siam. It is also recommended that men sent abroad for professional training should gain experience of large-scale manufacture of serum, vaccine and other biological products.

More co-operation is necessary between the heads of the Animal Industry Department, the Disease Control Division and administrative officials before any large scheme to immunize all the cattle and buffaloes of Siam can be inaugurated. All countries of South-East Asia are concerned with RINDERPEST and its control. Research in new methods of control should be concentrated in one centre.

The disease had been confined to the North and North-East Provinces of Siam. After the war, movements of troops and livestock spread the disease to the Central plain and it threatened the southern area which had been free from the disease for many years. The measures taken have freed the Central Plain from RINDERPEST.

The present numbers of livestock are estimated at between seven and nine million cattle and buffaloes. The disease has in the past been dealt with by giving sick animals large doses of serum and vaccinating the apparently healthy animals of the infected herd and also cattle of neighbouring herds. The method was limited by available stocks of serum and vaccine. The Mission recommends provision to produce goat virus, avianized virus and lapinized virus and their use on a large scale.

Recommendations are also made for the Veterinary Faculty of the University of Medical Sciences to train all subordinate staff needed by the Disease Control Division to suppress the disease.

The main difficulty appears to be possible opposition by the Siamese livestock owners to wholesale inoculation.—J. A. GRIFFITHS.

## BOOK REVIEWS

IRVINE, K. N. [D.M., M.A., B.Ch., Oxon., M.R.C.S., Eng., L.R.C.P., Lond.; Medical Superintendent Smith Isolation Hospital]. (1949.) **B.C.G. vaccination in theory and practice.** pp. xiii + 130. Oxford: Blackwell Scientific Publications, Ltd. 9s. 6d. 1520

Dr. Neville Irvine reached guarded but favourable conclusions about BCG vaccine in 1934. Since then a great deal more work has been done on the subject and he is to be congratulated on producing such an admirable review of the

subject, despite the fact that he has to devote most of his time to general practice. The history of the vaccine, theory of vaccination, methods of production, variation of the vaccine, virulence for experimental animals and safety for man, are all discussed.

The resistance produced in animals is briefly discussed and then the evidence supporting the value of the vaccine in man is carefully assessed. There is no longer any dispute about the safety of the vaccine, and, as the author says, it would seem



that "at long last BCG vaccination has been universally accepted as a valuable weapon for our armament in the fight against tuberculosis; humanity owes a great debt to the late Professor Albert Calmette and to Dr. Camille Guérin, who alone has lived to see the full results of their joint work."

The book contains well documented information on almost every aspect of BCG vaccination and can be thoroughly recommended.—J. F.

WAKSMAN, S. A. [Professor of Microbiology, Rutgers University; Microbiologist, New Jersey Agricultural Experiment Station.] (1947.) **Microbial antagonisms and antibiotic substances.** pp. 415. New York: The Commonwealth Fund. 2nd Edit. \$4. 1521

This second edition incorporates much new information on the properties of various antibiotics, especially of streptomycin. The whole rapidly expanding science of antibiotics is reviewed and the complex interrelationships of soil organisms discussed. There is a bibliography of over a thousand references.—M. C.

MULLIGAN, R. M. [M.D.; Professor of Pathology in the University of Colorado Medical Center School of Medicine.] (1949.) **Neoplasms of the dog.** pp. xi + 135. Baltimore: The Williams & Wilkins Co. 81s. 6d. 1522

This book is based on a study of over 1,500 neoplasms in dogs, but only the first 1,000 consecutive tumours have been used for compiling the statistical tables of the types of growth and their distribution. There are 59 full-page plates of black-and-white photographs and photomicrographs illustrating all the commoner types of neoplasm. Four pages of references provide useful information for further study. There is a technical supplement giving details of the methods of collecting and dispatching specimens to a laboratory and techniques of fixation, embedding and staining.

The neoplasms which formed the source of material for this work were provided by a large number of veterinarians and it is doubtful whether the incidence of the various types of neoplasm and their distribution in different breeds and situations can be considered representative of the general dog population. Epithelioma of the tonsil, for instance, is a not uncommon tumour in England and yet the only reference to it is to the 24 cases described in London by Withers: one wonders why this tumour was not found in the 1,500 specimens examined by the author. This neoplasm is easily diagnosed histologically and could not possibly be confused with any other type of growth and one must conclude either that it is a very uncommon neoplasm in Colorado or that the sample of 1,500 neoplasms was not a representative one. Similarly, mast cell sarcoma is represented by 78 tumours in the series and is said to

be very common in the Boston terrier and the boxer. In this case it is likely that other workers have recorded this type of growth under some other name. These difficulties illustrate the need for exchange of ideas between comparative oncologists so that neoplasms in domestic animals may be classified on a standard plan, even if such a plan needs alteration from time to time, and for some system whereby records of tumours in domestic animals can be collected and recorded so that a more accurate index of their distribution and characters may be available. Such work would be of great value to cancer research as a whole, for animal tumours are very similar to tumours in man in spite of the fact that many of them seem clinically to be less malignant than their histological counterpart in human pathology.

Short notes on the clinical behaviour of tumours are given, but the book is mainly of interest to the veterinary and comparative pathologist. Some evidence is presented to suggest that ovariectomy in early life protects dogs against the occurrence of mammary neoplasms.

[The establishment of a "Registry of Animal Tumours," on the lines of the "Registry of Bone Tumours" recently set up at the Royal College of Surgeons of England, would provide a centre which would collect and collate information and enable the incidence and characters of tumours in domestic animals to be determined more accurately than is now the case.]-E. G. WHITE.

GILBERT, F. A. (1949.) **Mineral nutrition of plants and animals.** pp. xii + 131. Norman, Oklahoma: University of Oklahoma Press. \$2.75. 1523

This survey of the more important recent reviews and other literature on the mineral needs of plants and animals covers a very wide field and provides a list of 329 references. After a brief account of the early history of plant nutrition, the classification of the chemical elements required in nutrition is discussed. Under the several headings of phosphorus, calcium, magnesium, potassium, sulphur, iron, copper, cobalt, manganese, zinc, iodine, boron, molybdenum, aluminium, sodium, chlorine, fluorine, arsenic, lead and selenium, an account is given of studies of the function of the element in plant and animal nutrition. In a final chapter the relation between human nutrition and plant and animal nutrition is briefly considered. The inclusion of much information in small space limits severely the extent of the discussion of the numerous problems reviewed but the real value of the book lies in its provision of an annotated bibliography likely to stimulate more intensive study by investigators interested in special fields.

—A. M. COPPING.

MONIER-WILLIAMS, G. W. [O.B.E., M.C., M.A. (Oxon.), Ph.D. (Freiburg), F.R.I.C.; formerly Inspector of Foods, Local Government Board,

and Chemist in Charge of Food Research Laboratory, Ministry of Health.] (1949.) **Trace elements in food.** pp. viii + 511. London: Chapman & Hall, Ltd. 30s. 1524

The author deals with 26 elements; some of these are essential for animal life (copper, zinc, iron, manganese, cobalt and iodine), others for plants only (boron, molybdenum and silicon), while most of them (lead, tin, arsenic, antimony, cadmium, nickel, etc.) may gain access to food only from industrial processes. The effects of an excess or deficiency of these elements for plant and animal life are discussed. The distribution of these elements in nature is given with special emphasis on their presence in foods as a contaminant or when added as a preservative. The more important food laws in regard to the use of preservatives in various countries are also mentioned. Each chapter dealing with one element also contains a detailed review of the various existing methods for the determination of the element in different foods and biological materials. There are, however, several omissions to recent developments in the fields discussed.—E. EDEN.

COHRS, P. [Professor of General Pathology of the Institute for Pathology at the Veterinary College, Hannover.] (1949.) Nieberle und Cohrs Lehrbuch der Speziellen Pathologischen Anatomie der Haustiere. [Nieberle and Cohrs' textbook of special pathology and anatomy in domestic animals.] pp. viii + 766. Jena: Gustav Fischer. 3rd revised Edit. DM. 48. 1525

The second edition of Nieberle's textbook appeared in 1945, but most of the copies were destroyed. Professor Cohrs has revised the text and has incorporated the results of recent work on a number of diseases. Nieberle's death obliged the author to undertake this work unaided. The many veterinary pathologists who made use of Nieberle's book will welcome this new edition, although the difficulties at the time of production have restricted the use of art paper and have reduced the value of many of the illustrations.

The book retains its original form and layout. It would be an advantage if the references to the literature were given in the conventional way at the end of each chapter or in a separate section instead of being inserted in the text, sometimes complete and at other times in such a way as to make it most difficult to trace the article concerned. New illustrations, some in colour, have been added and others have been omitted so as not to increase the size of the book. Further revision is needed to make this book a comprehensive textbook of veterinary pathological anatomy in which all the important advances of the last ten years are taken into account, but it remains a most useful work of reference.—E. G. WHITE.

HOFFBAUER, F. W. [M.D.] [Edited by]. (1948.)

**Liver injury.** [Transactions of the Seventh Conference January 15 and 16, 1948, New York, N.Y.] pp. 95. New York: Josiah Macy, Jr. Foundation. \$1.50. 1526

This yearly conference endeavours to draw together workers who are studying the problem of liver injury. The topics covered by papers given at the seventh conference included methionine metabolism and protein synthesis; rate of blood flow through the liver and hypertension. Speakers also dealt with liver cell regeneration and hepatic excretion of various compounds. The discussions following the papers are also recorded. The review is invaluable to those working in this field.—E. EDEN.

NUSSHAG, W. [Director of the Veterinary Institute of the University of Greifswald.] (1949.) Lehrbuch der Anatomie und Physiologie der Haustiere. [Anatomy and physiology of the domestic animals.] pp. xi + 269. Leipzig: S. Hirzel. DM. 20. 1527

This is the second volume in a series of textbooks for students of agriculture. It is illustrated by 247 black-and-white illustrations, mostly drawings, which are well designed to show the important features of the comparative anatomy of the domestic animals. There is a list of 60 German textbooks for further reference.

Except for digestion and the endocrine glands which are dealt with in special chapters, anatomy and physiology are dealt with together in the text. This method is well suited to an elementary textbook and forges a close link in the mind of the student between structure and function.

This textbook seems to fulfil well the object of its author—to provide a students' textbook and a book of reference for farmers.—E. G. WHITE.

GARCIA-BLANCO, J., & FORTEZA BOVER, G. (1948.) Nuevos metodos de coloracion en hematologia. [New methods of staining in haematology.] pp. xii + 92. Valencia: F. Garcia Muñoz. 1528

In this monograph the authors have approached the subject of blood-staining from a purely biochemical angle. They have obtained encouraging results with developments in the peroxidase methods of staining, particularly of the red cells. Some of the methods described give great sensitivity and allow correlation between intensity of colour and haemoglobin content. Stains applicable to white cells are also described.

One chapter shows the results obtained by the use of tetrabromophenolsulphophthalein in staining blood and bone marrow, either alone or in conjunction with contrast stains. Within certain limits this method determines approximate relations between colour and the pH of the constituents of the cell.

The monograph, which has been a fruitful collaboration between a biochemist and haematologists, is well illustrated with coloured plates of



blood and bone marrow of the dog, toad and frog.

Of the methods described some are fully developed and will be of immediate use in blood investigations. Others will require further study.

—I. W. JENNINGS.

FLYNN, J. E. [Edited by]. (1949.) **Blood clotting and allied problems. Transactions of the Second Conference, January 24-25, 1949, New York, N.Y.** pp. 231. New York: Josiah Macy, Jr. Foundation. 1529

In this volume are to be found nine papers on problems of blood coagulation presented at an informal conference attended by 19 eminent American clinical and laboratory workers in this field. A *verbatim* record of the discussion which followed each paper is also included, which adds greatly to the interest of the papers and gives a clearer picture of the direction of thought of the members of the conference.

The subjects discussed included, such topics as the separation of thromboplastin, the conversion of prothrombin, the status of blood platelets, etc. Among the many points of interest, not the least important fact forthcoming was that blood can be made to clot *in vivo* by injury to tissues near small blood vessels even when the vessels themselves remain uninjured. It was also pointed out that prothrombin can be converted directly into thrombin in the absence of calcium or other factors. These should be regarded as accelerators of this conversion rather than participants in the reaction and it appears that many as yet unrecognized accelerators may exist in the body.

Even a casual glance through these papers will show that many of the older conceptions must now be modified or even abandoned and since the phenomenon of blood coagulation is of such importance in medicine and surgery, a study of these papers will be found to be a most profitable undertaking.—J. A. NICHOLSON.

GRESSON, R. A. R. [Ph.D., D.Sc., F.R.S.E.; Senior Lecturer, Department of Zoology, University of Edinburgh]. (1948.) **Essentials of general cytology.** pp. ix + 184. Edinburgh: University Press. 21s. 1530

This textbook is "intended mainly for students of Botany and Zoology whose curriculum includes the study of the cell, either as a preliminary to the study of Genetics or as a separate course", but the veterinary student would also find it well worth reading. Both cytoplasmic and nuclear cytology are dealt with.

After an introductory chapter, which includes a brief history of the development of cytology, there follows an account of the physical, chemical and colloid characters of protoplasm, and then chapters on the structure of the animal cell and of the plant cell. There follow chapters on mitosis and cell division in animals and plants; meiosis; gametogenesis in animals; fertilization,

parthogenesis, and the origin of the primitive germ cells of some animals; reproduction in plants (three chapters); chromosomes and heredity; chromosomes and evolution; cytoplasm and heredity. Two chapters then describe the morphology, composition, function and behaviour of the Golgi material and mitochondria. These are followed by an introduction to the cytology of the Protozoa, and after a chapter on the cytology of degenerating and pathological animal cells, a final chapter serves as an introduction to cytological technique.

Five pages are devoted to a glossary of terms used in the text, and the list of references (to books and review articles as well as to original papers) includes about two hundred titles. The four chapters concerned with plant cytology were written by Mrs. H. H. Clark.

The illustrations, which are very good, number 71, of which 17 consist of one or more photomicrographs, and the remainder of line drawings. Print, paper and binding are good.

—E. COTCHIN.

BUCHER, O. [Prof. Dr. Med.] (1950.) **Histologie und mikroskopische Anatomie des Menschen mit Berücksichtigung der Histophysiologie und der mikroskopischen Diagnostik. [Human histology.]** pp. xi + 467. Bern: Hans Huber. Sw. fr. 59.50. 1531

This textbook is well suited to the needs of German-reading medical students. It comprises three sections—cytology, histology and microscopical anatomy. At the end of the second section is a chapter devoted to the differential diagnosis of the various tissues and organs: this aspect is also dealt with by the inclusion of short summaries in the section on microscopical anatomy. This is a useful feature of the book because it enables students to pick out the salient features of each tissue and organ, an exercise which will be of value in the subsequent study of pathological histology.

Throughout the text the author takes pains to relate structure to function and provides illustrations from the field of clinical medicine. A list of references to important monographs in German, French and English is given to cover the first two sections of the book, but the author refrains from giving a list of references to microscopical anatomy because of the enormous volume of published work and the difficulty in picking out references which medical students could usefully consult.

The 376 illustrations are black-and-white and coloured drawings executed with great care and providing simple but exact pictures which the student can readily understand. Some of the drawings are prepared with such attention to fine detail that they will withstand examination with a hand lens.

There are a number of tables which summarize the properties of different tissues and organs and assist in differential diagnosis. Printing and paper are excellent.—E. G. WHITE.

WINSLOW, C.-E. A., & HERRINGTON, L. P. (1949.) **Temperature and human life.** pp. xiv + 272. Princeton, New Jersey: Princeton University Press; London: Geoffrey Cumberlege. \$3.50. (28s.) 1532

In this book, the authors give an account of the influence of temperature and humidity on the human body; an aspect of physiology which up to the present has not received the attention its importance deserves. After a clear account of the mechanism of heat production and heat loss by the body, the adaptation of the body to varying thermal conditions is described. Then there follow details of experiments, using partitioned calorimetry as a guide, to determine the most suitable clothing for different purposes. Finally, air-conditioning and the influence of climate on human health are considered.

Although this book is primarily concerned with human health, veterinary readers will find it contains much of interest, particularly with regard to the intriguing question of the relationship of climate to disease.—J. A. NICHOLSON.

BURROWS, H. [C.B.E., Ph.D., F.R.C.S.] (1949.) **Biological actions of sex hormones.** pp. ix + 615. London, New York: Cambridge University Press. 2nd Edit. 42s. 1533

The first edition of this book was reviewed three years ago in these columns [see *V. B.* 17. 215]. This new edition has been considerably enlarged, a further hundred pages of text having been added and one thousand more references included in the bibliography. The process of bringing the text up to date has perhaps been a little uneven, but many references as late as the first half of 1948 have been included. The first edition has proved an invaluable work of reference to research workers, and this new edition is certainly welcome. Perhaps in future editions some uniformity could be adopted with advantage concerning the use of the words "oestrous", "oestral", "oestrus" and "oestrum".

—ALFRED T. COWIE.

KOCH, W. (1949.) **Hormone und Hormontherapie in der Tiermedizin. [Hormones and hormone therapy in veterinary medicine.]** pp. viii + 86. Stuttgart: Ferdinand Enke. 2nd revised Edit. DM. 7.80. 1534

In the first half of this book the author reviews concisely the physiology of the endocrine glands. In the first 12 pages, the hormones of the thyroid, parathyroid, pancreas and adrenal glands are considered, in the next 28 pages those of the hypophysis and gonads. The first section of the book also deals with the hormonal basis of pregnancy diagnosis tests in women and in mares. A

list of commercial hormone preparations available to the veterinarian in Germany is also printed. The second half of the book covers all the major aspects of hormonal therapy in veterinary medicine. The subjects discussed include sterility in the cow, mare, bitch, silver fox and poultry; male sterility; sterility in fish; the use of hormones in pregnant and parturient animals; the hormonal induction of lactation; the use of hormones in suppressing oestrus; the hormonal treatment of nymphomania; and the employment of hormones in fattening animals for slaughter. The last few pages contain detailed descriptions of the techniques of hormonal pregnancy diagnosis in the mare.

In the preface the author regrets that he has been unable to give proper consideration to relevant foreign work, nevertheless the book, on the whole, is remarkably comprehensive and up-to-date. It should be noted, however, that conclusive evidence has now been obtained both in the U.S.A. and in Great Britain to prove that the gonadotrophin present in pregnant mares' serum is of endometrial origin, and not hypophyseal as stated on page 38. In view of recent work on the role of the posterior pituitary in the physiology of milking, this subject warrants more attention than the few lines it has received. The paragraph on page 6 on the hormone of the thyroid is misleading, since iodine is not the hormone of the thyroid nor is thyroxin an iodoprotein. The description of the hormones of the adrenal cortex on page 11 is over-simplified and undue prominence is given to deoxycorticosterone which, although it is easily obtainable commercially and of great pharmacological activity, is of uncertain physiological importance. On page 21 the formulae for testosterone and androsterone should be transposed. Mis-spellings occur in the names Folley, Friedman, Harington and Laqueur. However, despite minor criticisms, the book should prove of considerable value to the veterinary practitioner and veterinary student. The research worker will find it of limited value as a reference book since a detailed bibliography is not given.—ALFRED T. COWIE.

ELTON, C. (1949.) **Animal ecology.** pp. xx + 209. London: Sidgwick & Jackson, Ltd. 4th Impression with additional notes. 18s. 1535

Elton's "Animal Ecology" has been a source of reference for workers in many biological fields since it first appeared in 1927. The book is a statement of ecological principle rather than a compendium concerning itself with the whole field of ecological inquiry. In the past many interesting observations failed to be recorded in the more accessible journals as all too frequently they were hidden away in the records of innumerable local natural history societies. Matters have now improved in this respect as there has been



a growing tendency for the local and the less widely read publications to amalgamate to form regional ones which are readily available to the scientific investigator. Local ecological work and natural history have now assumed a status never before enjoyed, as a result of critical encouragement and the collation of their data by such central and authoritative bodies as the British Trust for Ornithology and the Bureau of Animal Population. One now assumes that the magnitude of reliably recorded observation is such that it has become possible to lay down broad principles which will include within their scope and consideration all the detailed minutiae collected by observation in the field.

It is these principles that are the concern of the present book and the author has set out to state and illustrate them by examples. The list of contents reflects the approach: (1) The Distribution of Animal Communities, (2) Ecological Succession, (3) Environmental Factors, (4) The Animal Community, (5) Parasites, (6) Time and Animal Communities, (7) The Numbers of Animals, (8) Variations in the Numbers of Animals, (9) Dispersal, and (10) Methods.

The importance of the ecological approach to disease problems has become increasingly apparent over the last few years; ecology not infrequently provides a solution for many epidemiological problems. This book provides the raw materials for a reasoned approach to correct ecological interpretation and one has no hesitation in recommending it to all those whose work is concerned with the sociology and economics of animals, whether they be wild or domesticated.

—C. HORTON SMITH.

HADLEY, F. B. [D.V.M.; Formerly Professor of Veterinary Science, University of Wisconsin]. (1949.) *Principles of veterinary science*. pp. xi + 521. Philadelphia & London: W. B. Saunders Co. 4th Edit. 25s. 1536

This is a book written for laymen. Part I consists of eleven chapters (229 pages) dealing with anatomy and physiology. Part II, 14 chapters (474 pages) deals with diseases, and their prevention and treatment.

The anatomy and physiology are dealt with jointly and there is a good deal of detailed information on the various body systems. The disease chapters are: The meaning of disease; veterinary medicines; veterinary hygiene; veterinary pathology; wounds and wound infection; diseases of the digestive organs; mineral and vitamin deficiency; veterinary surgery; veterinary obstetrics; disturbances of the reproductive organs; other non-communicable diseases; some communicable diseases; veterinary parasitology, and poisons and poisoning. The index runs to 18 pages.

There are a 100 figures, most of them well

reproduced. A reader might wonder why Figure 68 is included. It is an excellent photograph of two young people bleeding a guinea pig from the heart. Readers would presumably not require instruction in this operation and the photograph would not teach them how to undertake it.

The binding and reproduction are good.

—G. B. S. HEATH.

DUNCAN, A. C. [F.R.C.V.S., B.Sc.; Lecturer in Veterinary Science at the Royal Agricultural College, Cirencester.] [Revised by]. (1949.) *Thomson's elementary veterinary science for agricultural students, farmers, and stock-keepers*. pp. vii + 474. London: Bailliere, Tindall & Cox. 6th Edit. 15s. 1537

In the preface the author states that the passage of time required that the results of research should be added, but that he had found a prevalent desire amongst students, agricultural organizers, and farmers that as much as possible of the old book should be retained. There is a dearth of good textbooks on veterinary subjects for agriculturists. Such a work as that now under consideration need not deal with too much detail. A better conception of the control of animal diseases might have been encouraged if their description had been separated from that of normal bodily structure and function.

In the control of livestock disease at the present time, emphasis should be upon good husbandry as well as upon an appreciation by agriculturists of the general mechanism of infection, and whilst, therefore, the two new chapters on Hygiene and Foods and Feeding are welcomed for the information which they contain, they might with profit have been extended at the expense of the two final chapters of the book.

The general subject matter conforms to that of previous editions, in that the horse is taken as the type animal and the body, in health and disease, is considered under the headings of its different organ systems. Such an arrangement does not usually lend itself to a clear description of the infectious disorders, neither does its rather rigid compass allow a coherent account to be presented of the more important practical aspects of The Diseases of Animals Act and Orders of Great Britain. The chapter sub-headings are clear, but the order of their presentation is not well arranged and frequent reference to the index is necessary.

Many of the factual details contained in the book are inadequate for the needs of the time. Although descriptions of the symptoms and treatment of minor digestive and other ailments in single animals are important, yet these are not conditions which cause the main economic losses to livestock keepers, and too little emphasis has been laid upon the control and prevention of infectious diseases. Vaccination against brucellosis and swine fever are dismissed in a few words and



the section on the treatment of bovine mastitis is some years out of date, whilst *Salmonella* enteritis and some important mineral deficiencies are not mentioned.

Although the book provides some useful information, it lacks coherence by reason of its somewhat encyclopaedic arrangement, and in general it cannot be said that it provides enough of the kind of information which agricultural students and farmers need on veterinary matters at the present time.—J. C. BUXTON.

WRIGHT, J. E. [Engineer-in-Chief's Office Library, G.P.O.] (1946.) **Manual of special library technique, with particular reference to the technical special libraries of commercial and government establishments.** pp. ix + 120. 17 illustrations & diagrams. London: Association

of Special Libraries and Information Bureaux. 2nd Edit. revised. 8vo. 8s. 6d. 1538

The great diversity of special libraries makes it by no means an easy task even to suggest the lines on which they might be organized. The author has, however, not only managed to put into his 120 pages much valuable advice for the beginner but also to indicate several ways of tackling some of the problems. He deals with the function of a special technical library, the material in it, the methods of acquiring and recording accessions, indexing, classification, cataloguing, loans, information work, staff accommodation and co-operation with other libraries. The book is well illustrated by diagrams and examples. Not only the beginner but also the experienced librarian may well learn from it.—M. M. RAYMER.

### BOOKS RECENTLY RECEIVED

[Notice of recently received books in this list does not preclude review]

ANTHONY, D. J. (1950.) **Diseases of the pig and its husbandry.** pp. xi + 309. London: Baillière, Tindall & Cox. 3rd Edit. 17s 6d.

BISHOPP, F. C., *et al.* (1948.) **Malattie e parassiti del bestiame.** [Animal diseases and pests.] pp. 214. Rome: Istituto Bibliografico Italiano. L. 300.

BURROWS, W. (1949.) **Jordan-Burrows textbook of bacteriology.** pp. xx + 981. Philadelphia & London: W. B. Saunders Co. 15th Edit. 45s.

CANTAROW, A., & TRUMPER, M. (1949.) **Clinical biochemistry.** pp. xix + 642. Philadelphia & London: W. B. Saunders Co. 4th Edit. 40s.

DAVIS, H. A. (1949.) **Shock and allied forms of failure of the circulation.** pp. xii + 595. New York: Grune & Stratton. \$12.00.

FULTON, J. F. (Edited by). (1949.) **A textbook of physiology.** pp. xi + 1258. Philadelphia & London: W. B. Saunders Co. 16th Edit. 50s.

MACLEOD, C. M. (Edited by). (1949.) **Evaluation of chemotherapeutic agents.** pp. xii + 205. New York: Columbia University Press. London: Geoffrey Cumberlege. 28s.

MILKS, H. J. (1949.) **Practical veterinary pharmacology, materia medica and therapeutics.** pp. 720. London: Baillière, Tindall & Cox. 6th Edit. 76s. 6d.

MILLER, W. C., & ROBERTSON, E. D. S. (1949.) **Practical animal husbandry.** pp. 590. Edinburgh & London: Oliver & Boyd. 5th Edit., reprinted. 24s.

OPPERMANN, T., HIERONYMI, E., & SONNENBRODT,

A. (1950.) **Lehrbuch der Krankheiten des Schafes.** [Textbook of diseases of the sheep.] pp. 328. Hannover: M. & H. Schaper. DM. 28.

PLUGFELDER, O. (1950.) **Zooparasiten und die Reaktionen ihrer Wirtstiere.** [Animal parasites and reactions of their hosts.] pp. viii + 198. Jena: Gustav Fischer. DM. 12.

RICHTER, J., & GÖTZE, R. (1950.) **Lehrbuch der Tiergeburtschilfe.** [Textbook of animal obstetrics.] pp. xii + 699. Berlin: Richard Schoetz. DM. 42.

SCHUBERT, G. (1948.) **Kernphysik und Medizin.** [Nuclear physics and medicine.] pp. 354. Göttingen: "Muster-Schmidt" K.G. 2nd enlarged Edition.

SIRI, W. E. (1949.) **Isotopic tracers and nuclear radiations with applications to biology and medicine.** pp. xiii + 653. New York, Toronto, London: McGraw-Hill Book Co. Inc. 1st Edit. 106s. 6d.

VOEGTLIN, C., & HODGE, H. C. (1949.) **Pharmacology and toxicology of uranium compounds. With a section on the pharmacology and toxicology of fluorine and hydrogen fluoride. Part I & II.** pp. xvii + 1084. New York, Toronto, London: McGraw-Hill Book Co., Inc. 1st Edit. 85s.

VOLKER, R. (1950.) **Eugen Fröhner Lehrbuch der Toxikologie für Tierärzte.** [Eugen Fröhner's textbook of toxicology for veterinarians.] pp. xx + 404. Stuttgart: Ferdinand Enke. 6th Edit. DM. 38.



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Commonwealth Bureau of Animal Breeding and Genetics, Edinburgh. The semen of animals and its use for artificial insemination. By James Anderson. Spring, 1945 ... ..		7s. 6d.
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